

ST.4

Do a Walk-Through Audit

Requires dialogue

This activity will help you to better understand the operational activities of the company and identify some strengths and weaknesses through a tour of the main facilities.



INPUT

- Data Gathering Checklist from the activity ST.1
Plan my data gathering strategy.

OUTPUTS

- At least five examples of both 'strength' and 'weakness' factors within the operational performance of the company. This output is used in the activity: ST.7 *Do a SWOT analysis.*

ST.4 Do a Walk-Through Audit

A good starting point for your data gathering about the current operational performance of the company is a Walk-Through Audit of the company's operations guided by the Focal Point member of staff. Suggestions for the things to look for and questions to ask your tour guide are provided in the *Walk-Through Audit Guide template*.

HOW TO GO ABOUT IT

1. Before the tour, read through the Walk-through Audit guide provided and add some specific questions of your own that you would like to have answered.
2. During the tour, use the guide to prompt discussions and gather additional information.
3. After the tour, write down in the *Walk-Through Audit Guide template*:
 - Key observations.
 - At least five strengths within the operational performance of the company.
 - At least five weaknesses within the operational performance of the company.

→ Further information in the Agri-food, Chemicals and Metals Supplements

Template of Walk-through Audit Guide

Key discovery questions		Page 2	
Getting started on tour	Production — main processes	Production — goods out	Design & Engineering
Production — goods in	Purchasing	Sales & Marketing	Management

Walk-through audit guide

Project _____

Date _____

Version _____

Getting started on the tour

- Ask to be shown round the production facilities in a logical flow, from 'Goods in', round each step of the processing, through to 'Goods out'.
- How many people work for the company?
- What is the gender balance in the workforce?
- What was the turnover of the company last year?
- Is the company growing (revenue and staff numbers)?

What other questions could be also relevant to your context?

Production - Goods in

- What are the main types of delivery you receive?
- Do you have a quality control system to inspect goods as they arrive?
- Do you ever have problems with poor quality goods?

What other questions could be also relevant to your context?

Production – Main processes

- Capturing a simple schematic diagram of the main process steps as you tour the production facilities can help to ensure you fully understand the complete process and identify any process steps you may have not been shown.
- Look for instances of waste (materials, energy, water, time)
- Which of the production process steps use the most materials/energy/water/chemicals?
- Which parts of the production process are the most problematic?
- What are the main contributors to production costs?

What other questions could be also relevant to your context?

Purchasing

- Who are the most important suppliers for the company?
- Are there any problems with these suppliers at the moment?
- Is sustainability performance a consideration in your purchasing decisions?

What other questions could be also relevant to your context?

Production - Goods out

- What happens to the product between leaving here and arriving at the end user?
- What means of transport are used?
- Does the company have its own distribution system or does it rely on a third party provider?

What other questions could be also relevant to your context?

Sales & Marketing

- Which are the most important product lines and markets for the company?
- How are the key product lines performing at the moment?
- Who are the most important customers within those markets?
- How do you market and sell your products?

What other questions could be also relevant to your context?

Design & Engineering

- Do you design your own products or manufacture to your customer's specification?
- Do you have Research & Development facilities on-site?
- Do you take sustainability issues into account when designing new products?

What other questions could be also relevant to your context?

Management

- Who in the company is responsible for managing sustainability issues?
- Do you operate an environmental management system?
- What is the gender balance within the Senior Management Team?
- What policies do you have in place to raise awareness of gender issues within the workforce and promote gender equality?
- Are there ways in which staff can raise concerns about health and safety issues or general working conditions?
- How is the company viewed by the local community?
- What has been the most significant innovation in the company in the last 5 years? Who was involved in that?

What other questions could be also relevant to your context?

ST.4 Do a Walk-Through Audit

Template of Walk-through Audit Results

Key observations			
General aspects	Production — goods in	Production — main processes	Production — goods out
Sales & Marketing	Design & Engineering	Purchasing	Management
Operational Strengths		Operational Weaknesses	



Walk-through audit results

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The diagram illustrates the relationship between Key observations and Operational Strengths/Weaknesses. It is structured as follows:

Key observations			
General aspects	Production — goods in	Production — main processes	Production — goods out
Sales & Marketing	Design & Engineering	Purchasing	Management

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Operational Strengths	Operational Weaknesses
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ST.4 Do a Walk-Through Audit

LEARNING CASE STUDY OF WALK-THROUGH AUDIT PROMPTS

Getting started on the tour

- Ask to be shown round the production facilities in a logical flow, from 'Goods in', round each step of the processing, through to 'Goods out'.
 - How many people work for the company?
 - What is the gender balance in the workforce?
 - What was the turnover of the company last year?
 - Is the company growing (revenue and staff numbers)?
- What other questions could be also relevant to your context?

- *What area of company operations is the biggest challenge at the moment?*

Production - Goods in

- What are the main types of delivery you receive?
 - Do you have a quality control system to inspect goods as they arrive?
 - Do you ever have problems with poor quality goods?
- What other questions could be also relevant to your context?

- Is there much tuna lost between market and factory?
- Where is tuna stored before processing? Cold storage facility?

Production – Main processes

- Capturing a simple schematic diagram of the main process steps as you tour the production facilities can help to ensure you fully understand the complete process and identify any process steps you may have not been shown.
 - Look for instances of waste (materials, energy, water, time)
 - Which of the production process steps use the most materials/energy/water/chemicals?
 - Which parts of the production process are the most problematic?
 - What are the main contributors to production costs?
- What other questions could be also relevant to your context?

- *How many worker injuries in the last 12 months?*
- *What happens to the tuna dark meat, bones, guts etc?*
- *Who supervises the production processes?*

Purchasing

- Who are the most important suppliers for the company?
 - Are there any problems with these suppliers at the moment?
 - Is sustainability performance a consideration in your purchasing decisions?
- What other questions could be also relevant to your context?

- *How is tuna sourced?*
- *Any concerns about the price or availability of tuna?*

ST.4 Do a Walk-Through Audit

Production - Goods out

- What happens to the product between leaving here and arriving at the end user?
- What means of transport are used?
- Does the company have its own distribution system or does it rely on a third party provider?

What other questions could be also relevant to your context?

- *Is there much product loss between factory and retailer?*
- *What is the greatest distance covered on a delivery run?*
- *Do the lorries back-haul?*

Sales & Marketing

- Which are the most important product lines and markets for the company?
- How are the key product lines performing at the moment?
- Who are the most important customers within those markets?
- How do you market and sell your products?

What other questions could be also relevant to your context?

- *Does the product have 'Dolphin Friendly' certification?*
- *How is the mix of B2B and B2C products handled?*

Design & Engineering

- Do you design your own products or manufacture to your customer's specification?
- Do you have Research & Development facilities on-site?
- Do you take sustainability issues into account when designing new products?

What other questions could be also relevant to your context?

- *Any experience of innovation in can/packaging design?*
- *How is engineering maintenance managed?*

Management

- Who in the company is responsible for managing sustainability issues?
- Do you operate an environmental management system?
- What is the gender balance within the Senior Management Team?
- What policies do you have in place to raise awareness of gender issues within the workforce and promote gender equality?
- Are there ways in which staff can raise concerns about health and safety issues or general working conditions?
- How is the company viewed by the local community?
- What has been the most significant innovation in the company in the last 5 years? Who was involved in that?

What other questions could be also relevant to your context?

- *Any metrics in place to assess sustainability performance?*
- *What actions are you currently taking to address the company's sustainability impacts?*

ST.4 Do a Walk-Through Audit

LEARNING CASE STUDY OF WALK-THROUGH AUDIT RESULTS

Key observations

General aspects

- Not collecting any data on materials waste or energy usage despite rising cost of tuna and significant energy use

Sales & Marketing

- Sales and marketing team good at developing novel, well-targeted promotions to increase sales

Production — goods in

- Some fish not usable when it arrives at factory due to lack of refrigeration in transit
- Only small sample of fish is checked before accepting new deliveries
- Nearby residents have complained about the noise from early morning deliveries

Design & Engineering

- No internal capacity for packaging material innovation
- One maintenance engineer – production delays if equipment fails and she is not available.

Production — main processes

- Some fish lost after cooking due to incorrect cooking process
- Well-optimised manual processing of tuna thanks to skilled, loyal workforce
- Majority (85%) of production staff are female
- Production Manager due to retire soon

Purchasing

- Cost of tuna rising steadily
- Experienced purchasing staff – have good relationship with fisherpeople.

Production — goods out

- Occasional delivery delays due to poor logistics management
- Poor palletisation and packaging sometimes leads to complaints from retail customers about damaged tins

Management

- No females in senior management team
- Good communication between management and operational staff
- Already measuring and monitoring a range of performance metrics

Operational Strengths

1. Well-optimised manual processing of tuna thanks to skilled, loyal workforce
2. Effective, innovative and adaptable sales and marketing team
3. Good communication between management and operational staff
4. Experienced purchasing staff – have good relationship with fisherpeople
5. Already measuring and monitoring a range of performance metrics

Operational Weaknesses

1. Production Manager due to retire in one year
2. No internal capacity for packaging material innovation
3. Loss of fish and product between point of delivery and arrival at customer
4. No females in Senior Management Team
5. Not collecting any data on materials waste or energy usage

ST.4 Do a Walk-Through Audit

TIPS & TRICKS

IDENTIFY MAJOR INPUTS AND OUTPUTS

Before beginning the walk-through audit, you should prepare walk-through audit sheets that list all the key issues to be checked or discussed when visiting the site. A template for completing a *Walk-Through Audit* is provided in the Eco-Innovation manual. Additional guidance on doing a walk-through audit in a food and drink processing company can also be found at: http://www.wrap.org.uk/sites/files/wrap/WRAP_Food_Drink_Manufacturers.pdf. Not all of the issues presented in the guidelines will be relevant, but think about where they could be applied in the company. Identify all the processing steps and key inputs and outputs.

Figure 8 shows some of the inputs and outputs from the food and drink processing industry. Be as specific as possible when identifying the processes, materials, and energy balances.

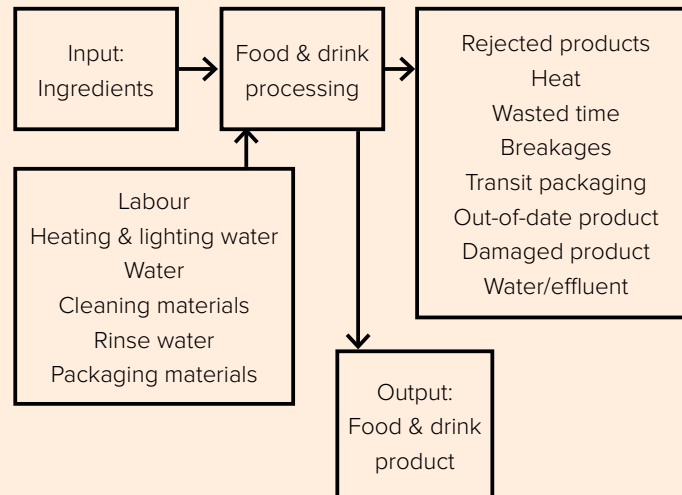


Figure 8. Generic process flow chart for a typical food and drink manufacturing process (WRAP, 2013)

ST.4 Do a Walk-Through Audit

LEARNING CASE STUDY

During the walk-through audit you have learnt about the current operations of Mango Pulp Co. and identified some of the challenges they are facing. The results of the audit are given in Figure 9.

The results of the walk-through audit were summarised to get a more comprehensive overview of the challenges in the Mango Pulp value chain. Some of the issues for Mango Pulp Company identified are:

Untrained farmers – seasonality and low wages are creating a high turnover of the workforce working at mango orchards. Thus, little or no resources are spent on training and education of the workforce in good agricultural practices. The consequence is lower quality and yields of mango production.

Limited access to good quality planting materials - There is a general shortage of grafted planting materials of higher-yielding varieties in many areas. Farmers often use inferior seedlings obtained by germinating mango seeds from indigenous varieties. Such ungrafted trees take much longer to bear fruit. Whereas grafted trees begin to bear fruit within 3 to 4 years, ungrafted trees will take at least 5 years to bear fruit, depending on the growing conditions.

Pest and disease problems – Mango trees can be affected by many pests and diseases, which can have devastating consequences and sometimes result in total yield loss. Major pests include the fruit fly (*Bactrocera invadens*), seed weevil (*Sternonchetus mangiferae*) and mealy bugs (*Rastrococcus invadens*). Diseases like anthracnose and powdery mildew are common in almost all mango growing areas.

Mango tree neglect - In many areas, mango trees are left to grow so big that pest and disease management, harvesting and other field operations are difficult to implement. Except in big or commercial farms, mango trees are normally scattered around the gardens, ranging from 2 to 100 trees per household. This scattered nature makes mango a commonly neglected crop in terms of management, but becomes important during the harvesting season.

Limited returns from mango production - Mango production is highly seasonal and harvest is only expected at certain times of the year, depending on the local conditions. During this time, most areas are harvesting and so the local markets are saturated and, therefore, offer very low prices, which may not even cover transportation costs.

Unstable quality and quantity of mango: The quality and quantity of the incoming mango changes significantly during the season as well as between different seasons. The mangoes needed for pulping have to meet several requirements in order to maintain the desired quality of pulp, such as: lack of insect infestation, lack of mechanical injury, stage of maturity, uniform texture, minimum soluble solids of 13° Brix (sugar content) and a pH between 3.5 and 4. Mangoes that do not meet the requirements are discarded.

Post-harvest losses: Mango is highly perishable and therefore susceptible to postharvest losses. Fruit damage is a common problem as a result of poor pest and disease management and the poor harvesting practices. Also, a lot of fruit is lost after harvest, especially during the peak seasons due to the limited capacity to store and process fruit. Poor roads and transport infrastructure to reach markets further worsen this problem.

ST.4 Do a Walk-Through Audit

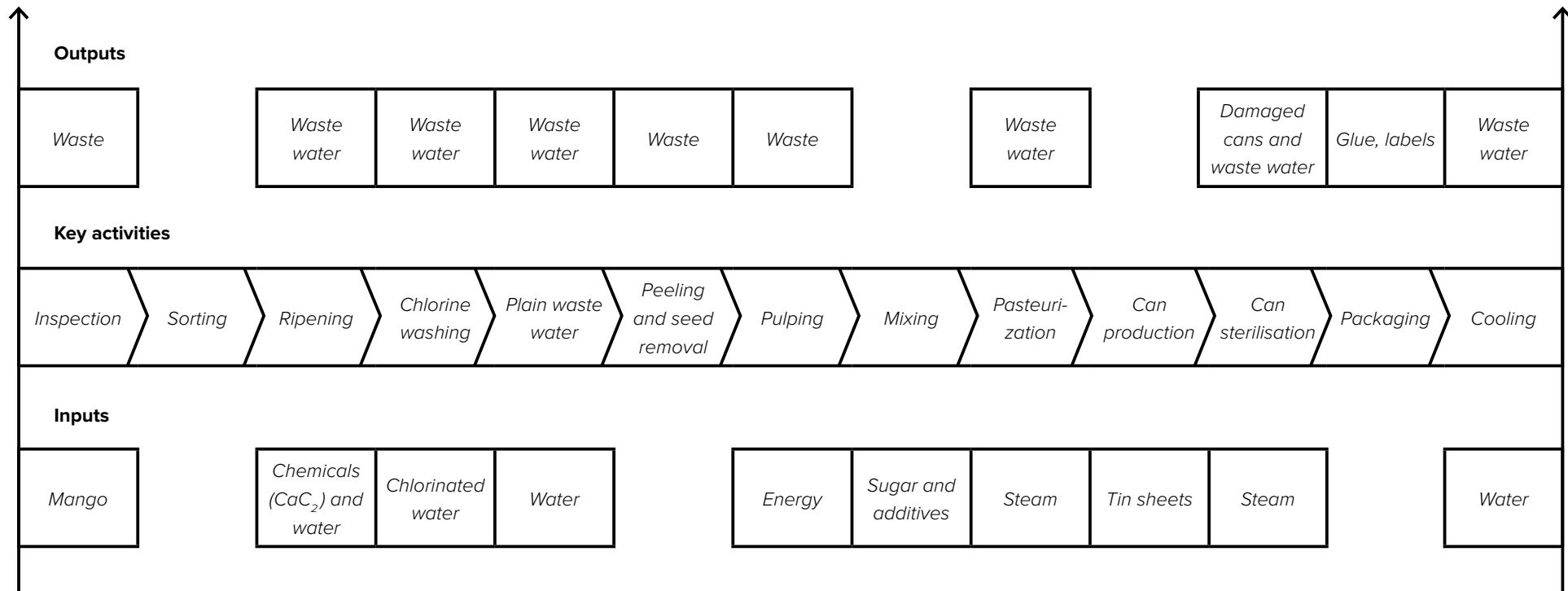


Figure 9. Current operations of Mango Pulp Co.

High waste generation during processing: As well as the mangoes that are discarded as unfit for pulping, waste is generated along the whole processing line. Much of the organic matter is removed during peeling and seed removal. Some is also lost during pulping as not all of the pulp can be pumped out of the tanks with the current technology. Finally, only 40% of the incoming

mango by weight is converted into pulp, which is significantly lower than the industry average of 55%. The organic waste is collected and disposed of by using municipal services that are costly. During high season locals have also complained about the odour coming from the facility.

ST.4 Do a Walk-Through Audit

BACKGROUND INFORMATION

Ripening mangoes with Calcium Carbide (CaC₂): Mangoes are ripened using Calcium Carbide, which is a toxic chemical and extremely hazardous. It is perceived as the most economical way to ripen a mango, but a banned chemical in many countries, and should not be used for ripening of fruits. Fruits ripened with chemicals often do not ripen uniformly and the quality of the final fruit can be lower. Using ethylene gas for ripening might be a better option, as it is not associated with any food safety issues.

Lack of quality and safety control: Lack of quality and safety control throughout the value chain, as well as in processing itself, is limiting the ability of Mango Pulp Co. to compete in export markets. Meeting quality and safety standards such as ISO9000 or ISO22000 is crucial for realising the high export potential of mango pulp.

Chlorine washing: Chlorine is used to eliminate pathogens on the surface of the mangoes. However, chlorine is poisonous and can have negative health effects and can be a pollutant if released into the environment. Chlorine is also highly corrosive and damages the equipment used for washing.

Impact and cost of distribution: Depending on the intended market, the mango pulp is transported by sea or road. The cost of distribution is dependent of fossil fuel costs and has a substantial impact on the environment.

Waste generation in consumption and end-of-life: Packaged mango creates a lot of solid waste from packaging materials, such as tin cans, glass bottles and plastic. In many countries, the cans and bottles are not reused or recycled and go to landfill. Also, the size of the packaging is not adjusted to contain the correct portion for end consumers, resulting in the excess mango being wasted.

References

WRAP (2013). Business Resource Efficiency Guide: Self-assessment Review for Food and Drink Manufacturers. Available from: http://www.wrap.org.uk/sites/files/wrap/WRAP_Food_Drink_Manufacturers.pdf

ST.4 Do a Walk-Through Audit

TIPS & TRICKS

USE A CHEMICAL INVENTORY TO SCREEN FOR CHEMICALS OF CONCERN

The first step in identifying chemicals of concern that should be prioritized for elimination, substitution or protective control measures, is to establish and then screen an up-to-date and accurate chemical inventory.

If a chemical inventory is not available, you can offer your services to the company to develop an actionable chemical inventory. Information on hazards and safety precautions are typically found on the Safety Data Sheets (SDS). If the SDS is not up-to-date, you can use the CAS # and find the harmonized hazard classification and other information on the chemical

on the European Chemicals Agency's website 'Information on Chemicals': <http://echa.europa.eu/information-on-chemicals>

Use this safety information to help you understand and identify safety related issues, but also to ensure human health and safety along the value chain (transporters, customers, communities).

USE VALUE STREAM MAPPING TO IDENTIFY AREAS FOR PRODUCTIVITY IMPROVEMENT

Value Stream Mapping can be a useful tool to characterize the whole business process and identify areas for productivity improvement. You can use the audit and Value Stream Mapping to identify added-value techniques to improve their current operational deficiencies. Such techniques are typically low-cost and result in a better bottom-line. You can find out more about Value Stream Mapping on the US EPA's website: <http://www.epa.gov/lean/environment/toolkits/environment/ch3.htm#introduction>

LEARNING CASE STUDY

During the walkthrough audit and a workshop conducted at the company with key personnel, you identified the strengths and weaknesses of TipTop Textiles Co.'s current operations.

An audit of the company showed that material consumption is the highest cost element of the company followed by personnel costs. The cost for materials is mainly attributed to bleaching agents, dyestuffs, pigments, finishing agents, textile auxiliaries (e.g. lubricants) and basic chemicals (e.g. solvents). See Figure 3 for further details.

ST.4 Do a Walk-Through Audit

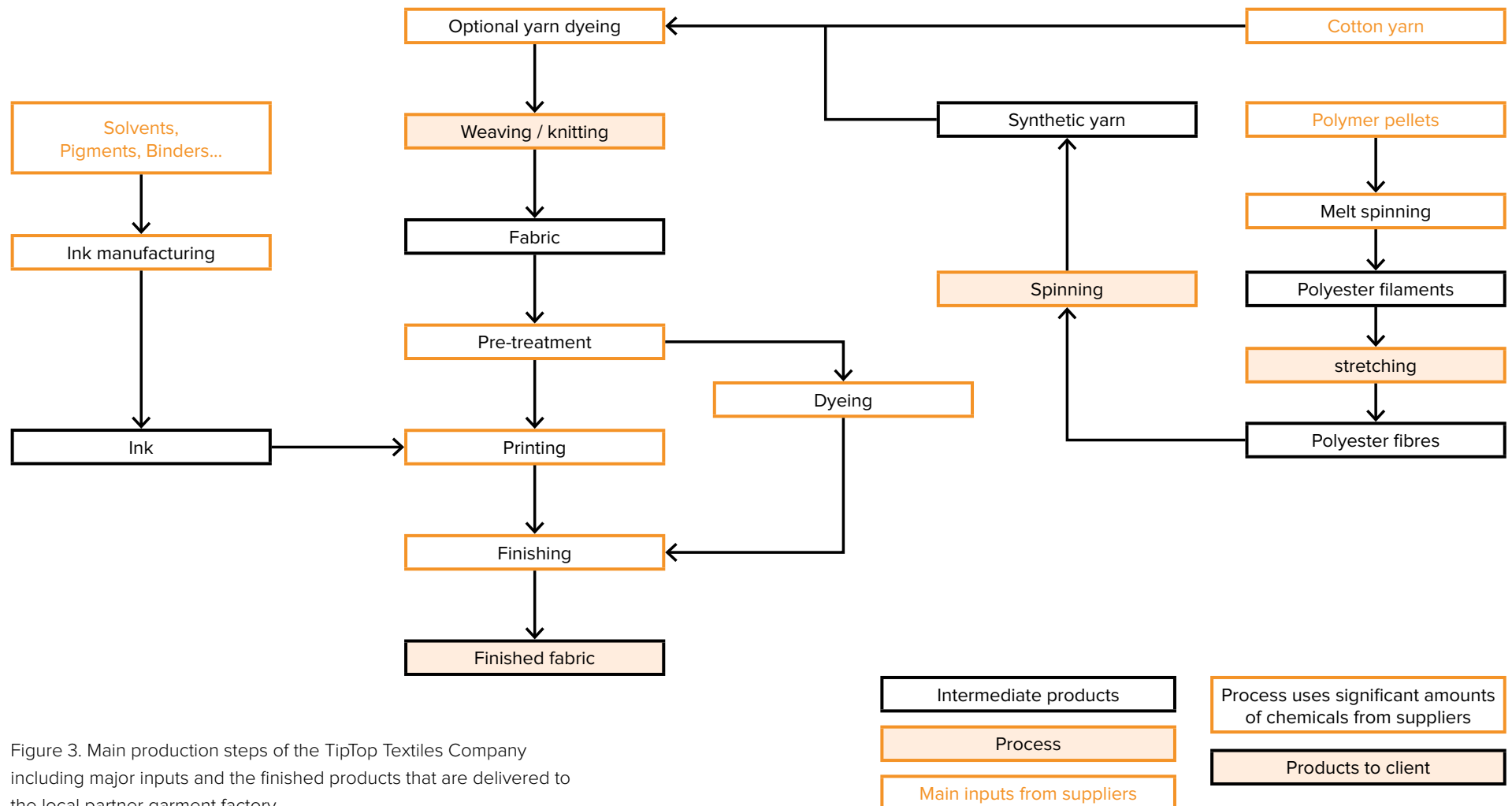


Figure 3. Main production steps of the TipTop Textiles Company including major inputs and the finished products that are delivered to the local partner garment factory.

ST.4 Do a Walk-Through Audit

The walk-through audit and discussion with responsible TipTop Textiles Co. staff revealed the following major internal strengths and weaknesses:

Operational strengths

- High quality finished textile with little off-spec material and quick and on-time delivery
- High quality dye and ink due to own manufacturing by chemists and engineers; quick adaptations are possible
- Well-equipped R&D/Quality Control (QC) lab with experienced personnel and line operators (polyester fibre production, ink manufacturing, textile finishing)
- Effective, innovative and adaptable sales and marketing team
- IT-based Customer Relationship Management (CRM) system for integrating marketing, sales, production, delivery, and payables
- Good customer relations with local garmenting industry, corporate wear customers, and school customers
- Strong financial position (good cash flow and reserves)
- Existing cooperation with local university

Operational weaknesses

- Fluctuating raw material prices, especially cotton and polyester pellets suppliers
- High energy and water costs due to non-optimised equipment and batch processes including water removal, heating (and recovery), and liquor ratio
- Large amount of (hazardous) waste produced, especially in ink manufacturing leading to expensive disposal costs

- Occupational health issues related with the production and use of printing inks as well as the cleaning of printing equipment (e.g. printing rolls and related equipment are cleaned using solvents in open cleaning machines) in different parts of the facility
- Insufficient wastewater treatment: Large amounts of wastewater from the textile finishing process are released to local river impacting local communities and river quality through releases. Local communities rely on the river for fishing and field irrigation.

ST.4 Do a Walk-Through Audit

TIPS & TRICKS

PERFORM A SIMPLIFIED VALUE-STREAM MAPPING AS PART OF THE WALK- THROUGH AUDIT

It is possible for you to use a simplified value stream mapping method (see US EPA Lean and Environment Toolkit) to characterise the whole business process from customer order to product/service delivery.

CONSIDER KPIS AND BENCHMARKS

Try to gather data during the audit that could enable you to evaluate important metals sector manufacturing Key Performance Indicators (KPIs) for the company. Such KPIs cover topics including process efficiency (value-added time/total lead time), recyclability, and overall equipment efficiency – further examples of KPIs for the metals sector are provided in the *Background Information* section. Moreover benchmarking against best practice standards (e.g. world class process cycle efficiencies can exceed 25%) can be useful to identify priority areas for operational improvement.

TRY TO IDENTIFY CHEMICAL-RELATED RISKS AND HAZARDS

Information on hazards and risks related to chemicals used/handled, stored at the production site (e.g. cleaning agents, paints, lubricants, etc.) are explained on hazard/risk labels and in Safety Data Sheets (SDS) that should be made available by the company's suppliers. This information can help you to understand and identify any safety or occupational health related issues to be considered in order to improve the situation of the workers and also other value chain stakeholders (transporters, customers, communities).

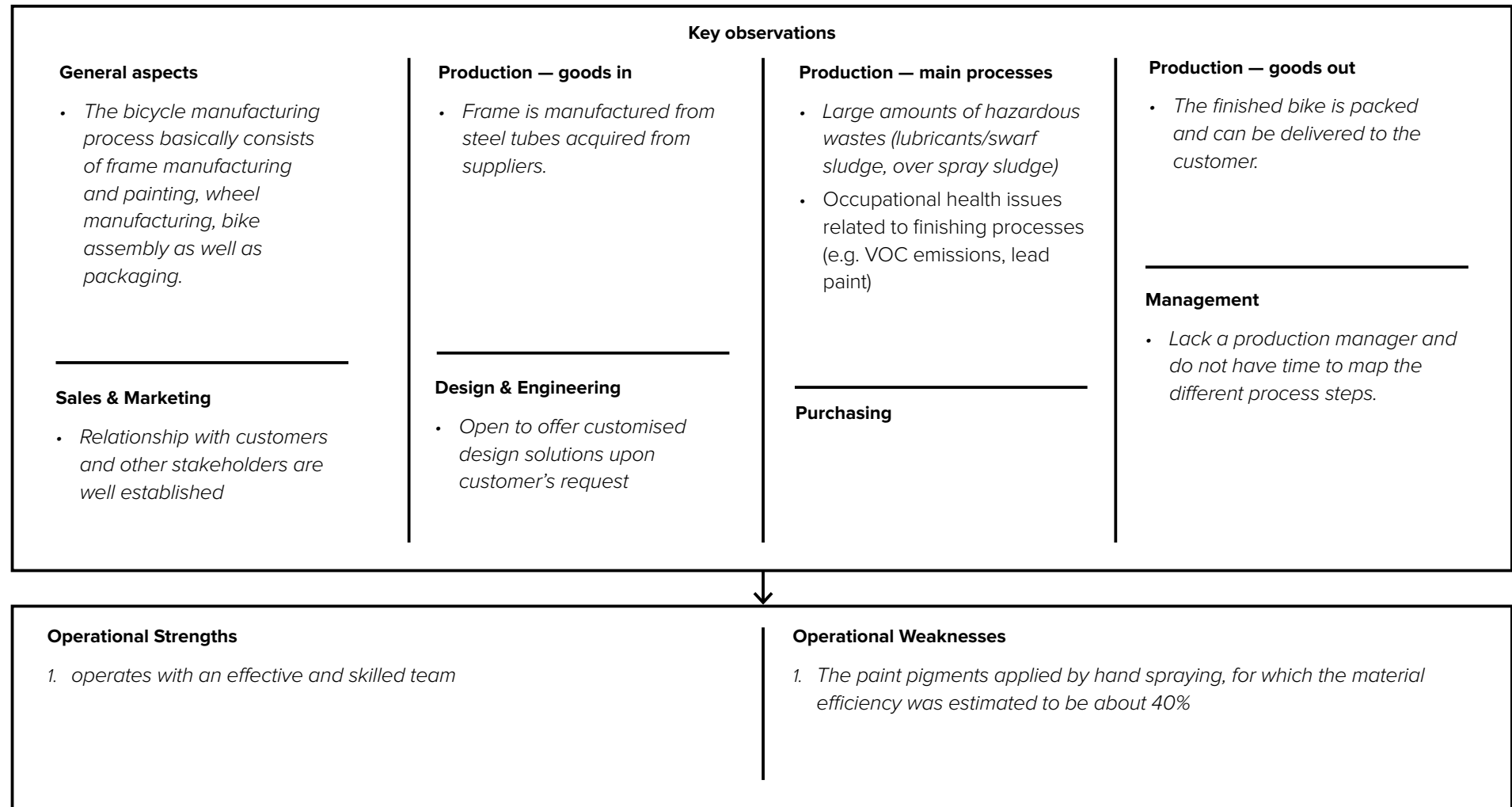
CONSIDER CUSTOMERS SPECIFIC REQUESTS

When completing the activity *ST.4 Walk-through Audit*, you can also ask the company about specific requests from customers or other stakeholders regarding environmental performances and quality of products or operations, such as:

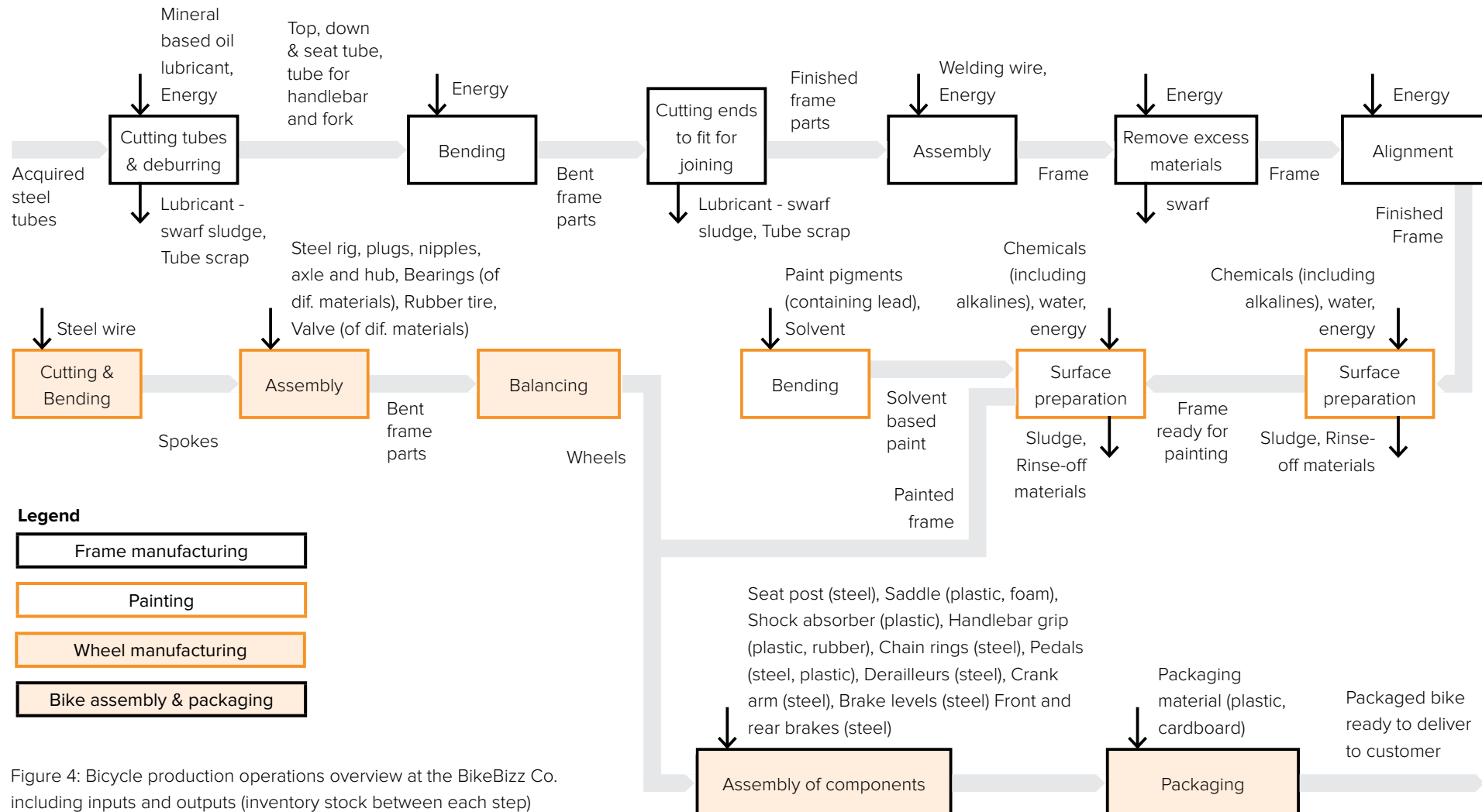
- Carbon/water/chemical footprint
- VOC-free formulations (e.g. coatings, inks)
- Heavy-metal free products (e.g. lead-free paints)
- Compliance with national laws on workplace health and safety policies (e.g. VOC fugitive emissions)
- Disposal or valorisation of hazardous waste (e.g. paint overspray sludge)

ST.4 Do a Walk-Through Audit

LEARNING CASE STUDY WALK-THROUGH AUDIT RESULTS



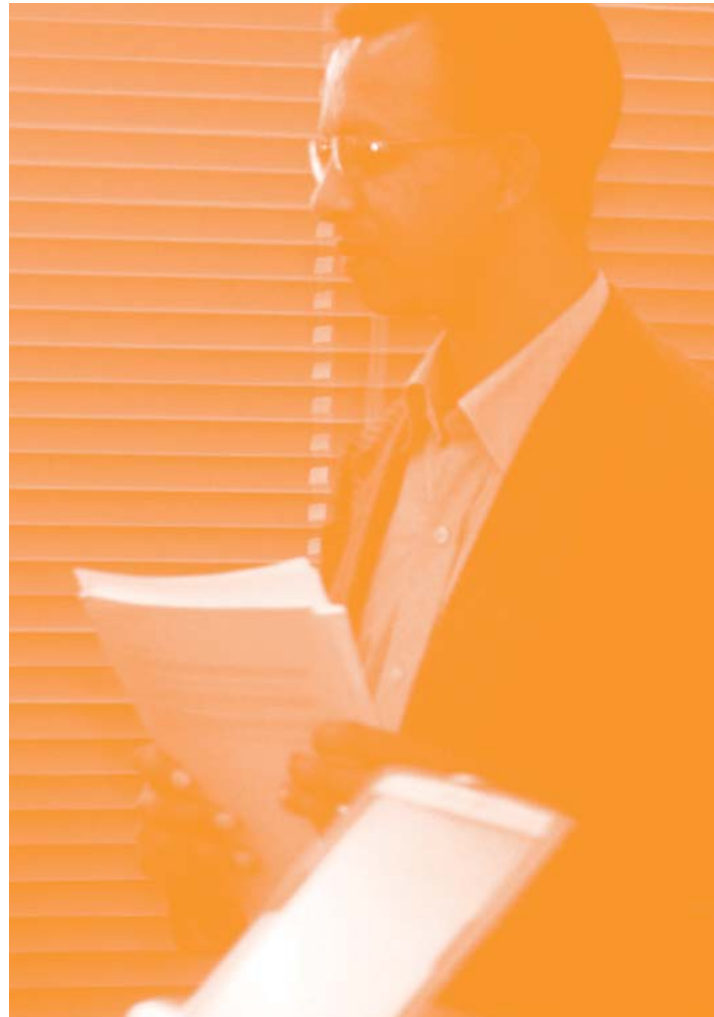
ST.4 Do a Walk-Through Audit



ST.4 Do a Walk-Through Audit

From the *Life-cycle Thinking* template, the results of the *PESTEL* and the *Walk-Through Audit*, the main sustainability challenges and opportunities along the life cycle of the bicycle, the so-called sustainability hotspots, are identified:

- Growing demand for affordable, high quality forms of transportation (e.g. bikes) in local market
- Competition from low-cost international companies putting pressure on market share
- Increasing costs of energy and process agents in the metal fabrication production
- Growing demand for sustainable products and services in the bicycle production
- Increasing interest from long-term investors in companies involved in sustainable production
- Waste generation along the bicycle life cycle (raw materials extraction and production, end-of-life bicycles)
- Health and safety issues along the life cycle of the product
- Lack of recycling infrastructure for different waste streams (metals, hazardous waste)



ST.4 Do a Walk-Through Audit

BACKGROUND INFORMATION

Table 6 presents examples of different indicators to measure sustainability in the metals sector. Elements in bold indicate important KPI's for the metals sector.

Table 6: Examples of different indicators to measure sustainability in the metals sector [OECD toolkit, 2011].

Group of indicators	Examples of indicators
Business performance	<ul style="list-style-type: none">• To gauge operational performance, market and marketing efforts
Operational	<ul style="list-style-type: none">• Overall Equipment Effectiveness<ul style="list-style-type: none">• Lean metrics: batch cycle time, inventory days of supply (IDS), process velocity...
Environmental indicators	<ul style="list-style-type: none">• To measure the interaction with or impacts on the environment
Inputs	<ul style="list-style-type: none">• Restricted substances intensity• Recycled/reused content
Operations	<ul style="list-style-type: none">• Water/Energy intensity• Renewable production of energy
Residuals intensity	<ul style="list-style-type: none">• Air/water releases intensity
Products	<ul style="list-style-type: none">• Recycled/reused content• Restricted substances content
Recyclability	<ul style="list-style-type: none">• Energy consumption intensity• Water/Carbon/Chemical footprint