TEST Step by Step - PLAN

	Step	Purpose
PLAN	1.1. Initial screening	Initial screening: go/no-go for TEST
	1.2 Scoping and Policy	Top management commitment to RECP and scope of the work
	1.3 TEST team	Plan, organize and train internal company team (as well as external team, if created).
	1.4 Identifying total cost of NPO and priority flows	Starting the diagnosis: Identify the non-product output (NPO) costs and volumes at company system boundary.
	1.5 Setting up focus areas	**Continuing the diagnosis: identify focus areas at the level of production steps (e.g. cost centres).**
	1.6 Revealing sources and causes of inefficiency	Concluding the diagnosis: identify sources and reveal root causes of inefficiency and pollution within focus areas.
	1.7 Option generation and feasibility analysis	Broadening the scope of possible improvement solutions and techno-economic analysis of a set of optimized feasible measures
	1.8 Action plan	Plan of actions for implementing and monitoring validated measures.

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P 1.5 – Setting up focus areas

Which manufacturing processes and areas have the most significant share of NPO costs and the greatest potential for improving resource efficiency?

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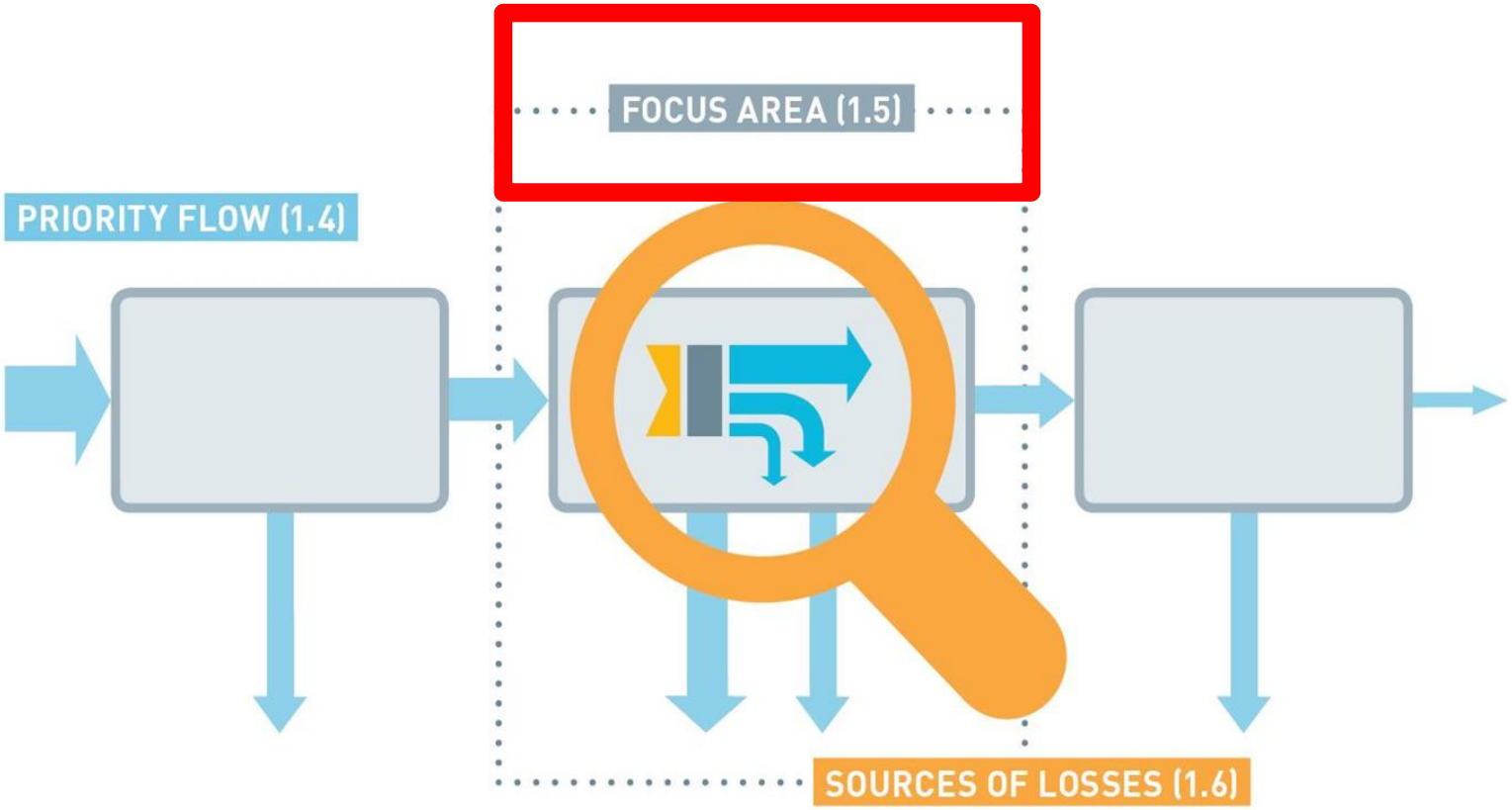
Moving from company system boundary to focus area level



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Overview of Step 1.5

Inputs	Activities	Outputs
MFCA excel tool filled in at the company system boundary (worksheet 1) for previous year Priority flows selected in step 1.4 Company process flow chart, list of cost centers Material, water and energy balances at company level Objectives and KPIs defined at the company level International benchmarks for individual production processes	Define production steps as operating cost centres (if cost centres are not already defined). **Assign annual NPO costs to identified cost centres/ production steps and complete MFCA tool worksheet 2.** For energy flows, the energy mapping tool can be used. **Set up objectives, OPIs for cost with highest NPOs, Benchmarking.** Select focus areas	NPOs in money and, if available in volume, terms assigned to main production steps (cost centres) Inconsistencies identified in company information systems, and recommendations elaborated for better data monitoring Savings potential developed for areas with high NPO costs Focus areas selected and related to priority flows OPIs related to focus areas

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MAPPING COST CENTRES WITH PROCESS FLOW CHART

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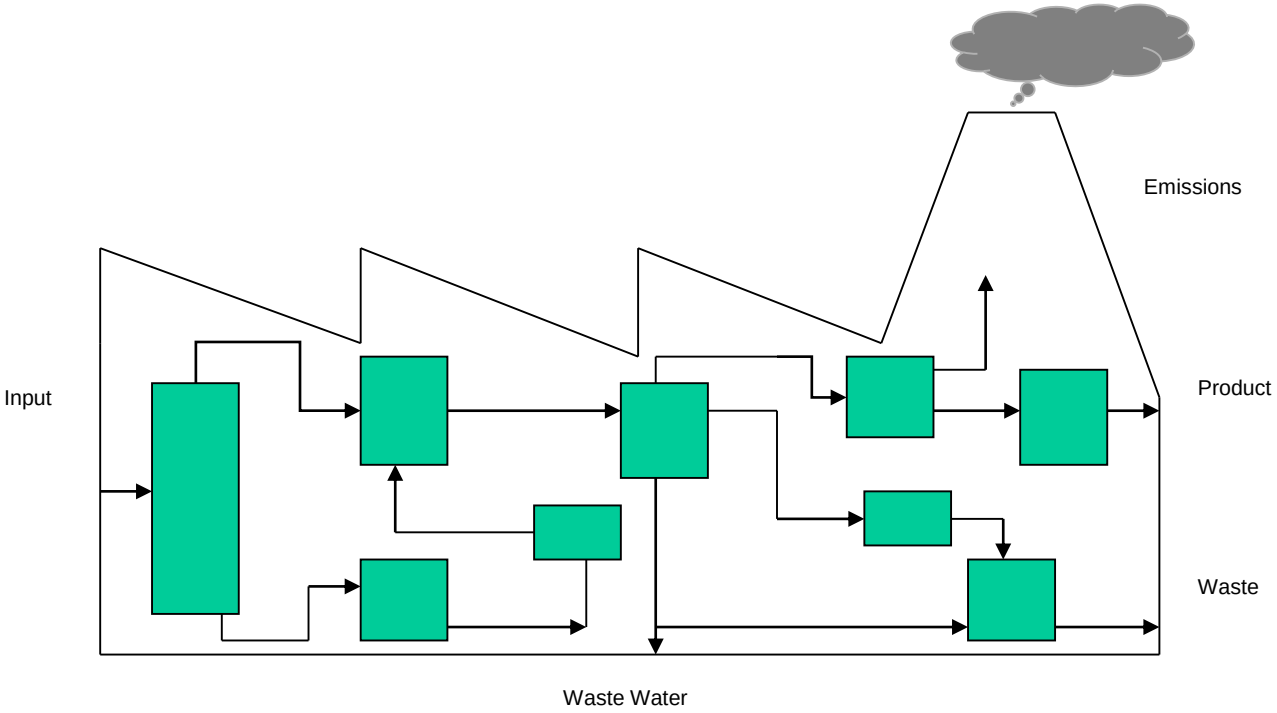
Mapping process flows and cost centres



Goals:
Consistency
Defined interfaces
Basis for material flow cost accounting

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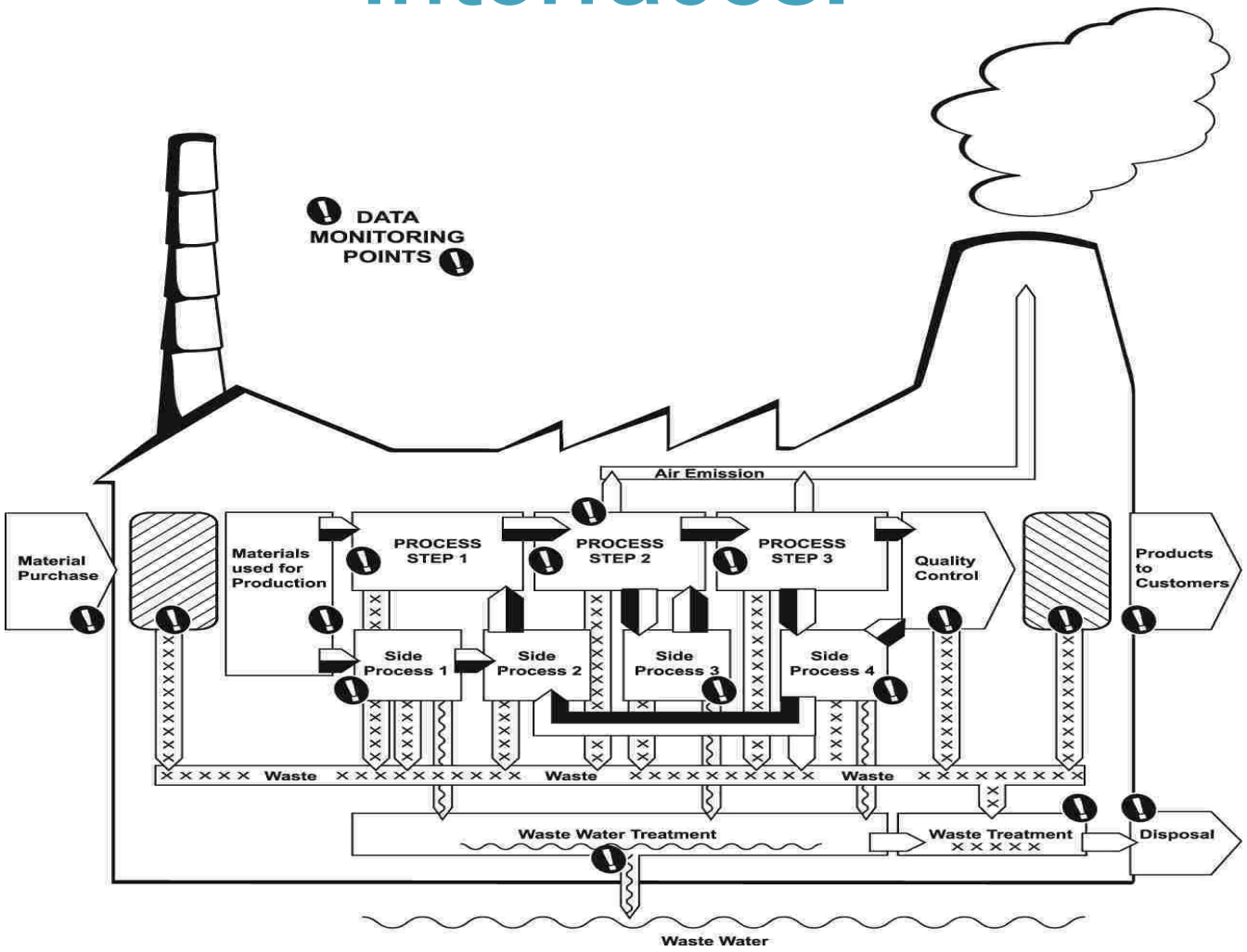
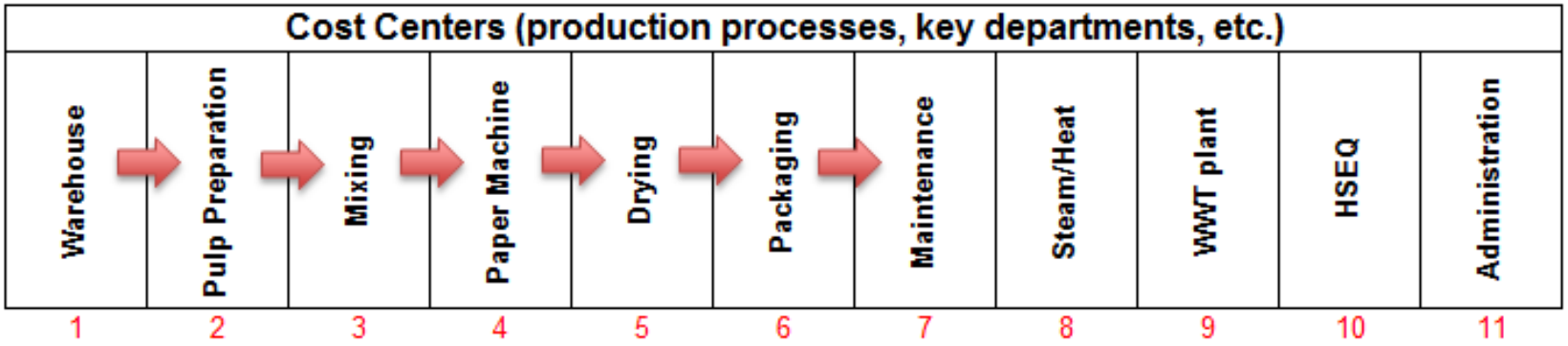
Comparing Interfaces!



NPO Costs Breakdown

- The third sheet of the MFCA tool is the Costs Breakdown.
- The first step is to fill out the horizontal list of Cost Centers, previously defined.



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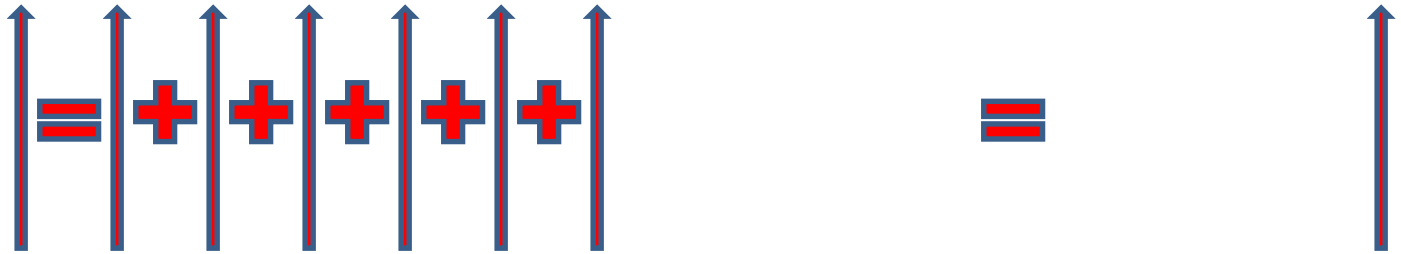
NPO Costs Breakdown

- At this point, we shall start allocating the **NPO costs to** the different Costs Centers that are horizontally listed. *Can be based on estimates in the first try and done for the priority flows only*
- Note that the sum of the costs allocated to the **Cost Centers** from each item should be equal to the total NPO cost figure of that item. As shown below

		Cost Centers (production processes, key departments, etc.)												
	NPO Costs	Warehouse	Process step I	Process step II	Process step III	Process step IV	End Store	Maintenance	Steam/Heat	Refrigeration	WWT plant	Logistics	HSEQ	Administration	total check
Raw and Auxiliary Materials															
Pulp	100,000	5,000	30,000	20,000	30,000	10,000	5,000								100,000
															0



NPO Costs Breakdown

Vertically, we will be listing all of the input items along with their **NPO costs** that we just obtained in the previous step.

	NPO Costs
Raw and Auxiliary Materials	
Subtotal	
Packaging Materials	
Subtotal	
Operating Materials	
Subtotal	
Water	
Subtotal	
Energy	

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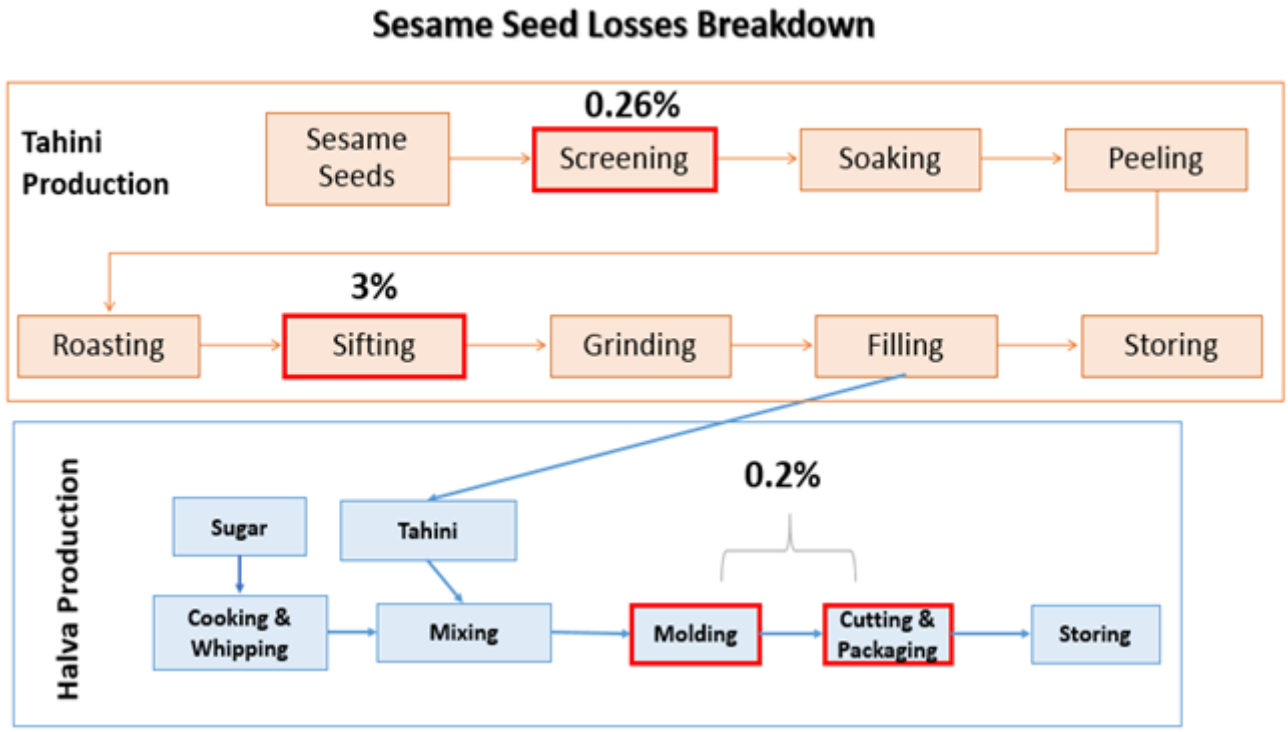
Results - Focus Areas

- Identifying **Focus Areas**

Each flow's NPO Cost is divided among the Cost Centers previously identified to represent the Process Flow. Focus Areas are the Cost Centers that have the highest monetary share allocated to them.

	Cost centers (production processes, key departments, etc.)						
ENVIRONMENT-RELATED COST CATEGORIES	Total Euros	Storage	Pulp preparation	Mixing	Paper machine	Drying	Packaging
1. NON-PRODUCT OUTPUTS (NPO) COSTS							
1.1. Raw and Auxiliary Materials							
Pulp	445,000	45,000	150,000	24,000	5,000	126,000	95,000

Example – Sesame seed mapping losses



Baseline, Setting up Indicators (OPIs) and targets for priority areas

Priority flow	*Priority area*	*Operational Performance Indicators*	*Indicator Baseline*	*Estimated Company Targets & Objectives*
Sesame seeds	Sesame screening	Sesame consumption	1.002 Tonne / Tonne product	Lowering the sesame loss from actual 3% to 1% at Sifting stage
	Sesame roasting and drying	Sesame consumption	1.05 Tonne / Tonne product	
	Sifting- fine & crude	Sesame consumption	1.03 Tonne / Tonne product	
Water	Sesame soaking	Water consumption	11.4 m^3 /Tonne product	Lowering the plant water consumption by 25%
Energy- Fuel oil	Sesame roasting and drying	Fuel oil consumption	0.016 liter /Tonne product	3-4%
Energy- Electricity	Overall production processes	Electricity consumption	303.02 Kwh. Tonne product	5-6%
Energy- overall plant	Overall production processes	Energy consumption	3.25 GJ/ tonne product	To map and monitor energy uses

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Information system – focus areas

- Record the loss of sesame seeds at sifting stage, at each batch
- Recalculate the packaging material loss at the filling line for sesame and halva production lines
- Install water meter at soaking line, monitor monthly use
- Monitor energy use at roasting and drying

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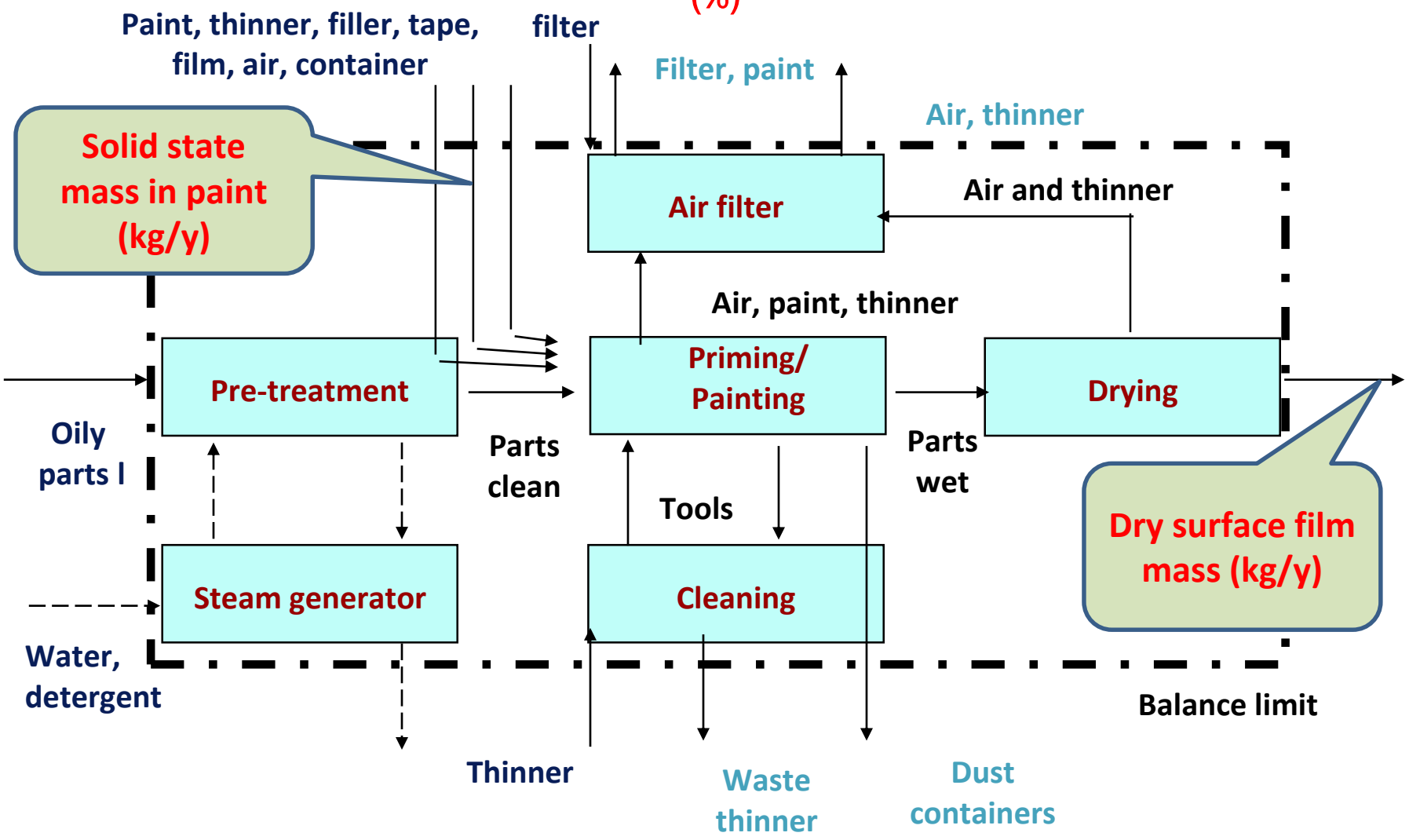
EXAMPLE of Indicator – Paint application efficiency (%)

Solid mass within annual amount of paints and solvents per solid mass at product (%)

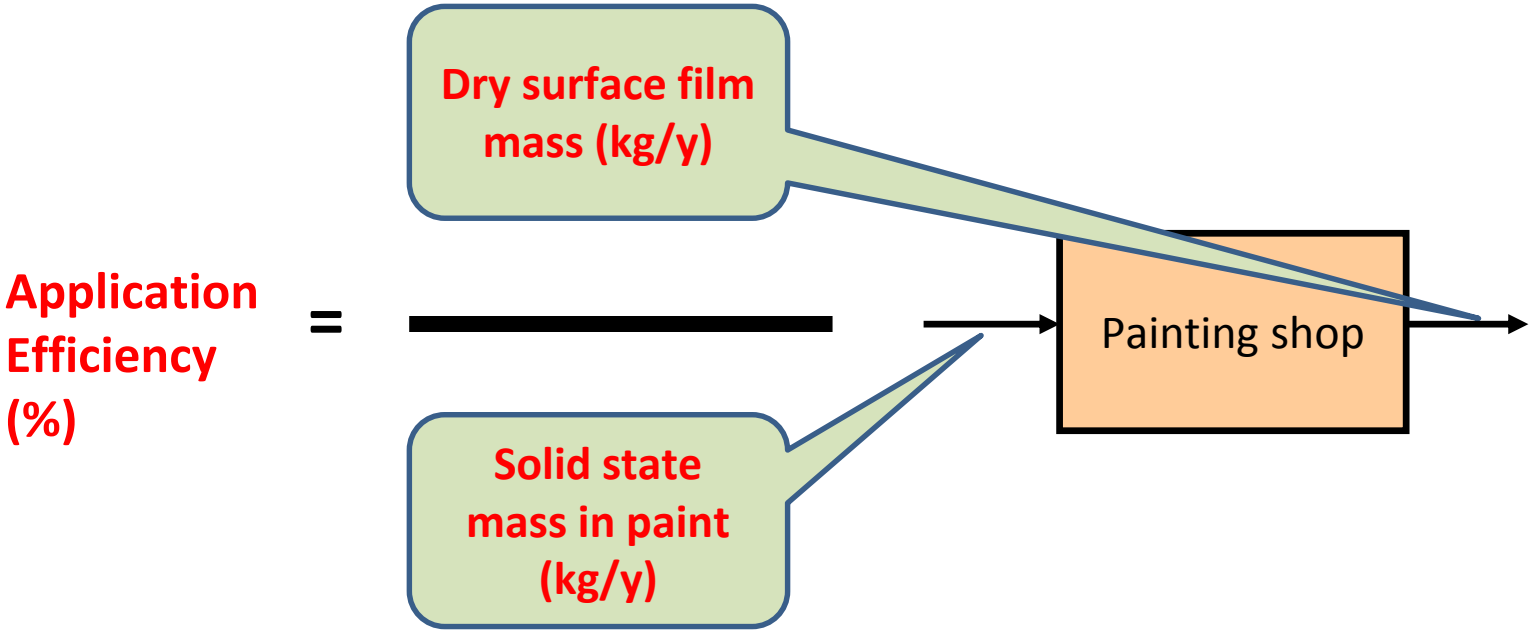


Source: UNIDO CP Toolkit

Operation performance indicators (OPIs)

Set up OPIs for focus areas (cost centres/processes with highest NPO costs)

Example of OPI for the painting shop:



Setting up baseline

- **Baseline** based on data from previous year:

  Application efficiency for paint utilised in the painting shop is 25%

- Data for calculation of baseline were collected
  - for inputs based on knowledge of the solid state mass content within paint and annual amount of paint used based on process records
  - for desired product output as a theoretical calculation based on specification of surface finsishing and number of m^2 painted

Both sources of data can be not very reliable, however, this will be improved over time within the next steps. OPI for paint application efficiency will be part of an information system on important flows which will be planned within step 1.8.

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Estimating potential for improvement

- Benchmark performance of specific processes/cost centres (if sector data are available)
- Walk through process for expert estimation of improvement potential of prospective focus areas

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EXAMPLE: Benchmarking data

for application efficiency of paint (expressed in % solids)

Conventional	**35-50%**
HVLP (High Volume Low Pressure sprayer)	**50-70%**
Airless	**40-75%**
Electrostatic	**50-85%**
Rotating disc	**75-90%**
Dipping	**90%**
Rolling	**98%**

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Identify potential for technical improvement

Potential to achieve the same economic output with:

- Less Input (conserving water, energy and raw materials)
- Less Environmental risks

Do not hesitate to ask for very rough expert estimation again if there is not more accurate data available: it is better to be "approximately right than accurately wrong" - and enterprises are accurately wrong if they relate all production costs only to Product Output

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Highlights

- Mapping cost centres with process flow chart
- Assigning costs and volumes to cost centres and selecting focus area
- Setting up indicators and baselines
- Identifying potential for improvement
- Setting up objectives and targets for improvement
- **Information system: OPIs for focus areas, installing metering system for energy significant users**

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Linkages with EMS

EMS Not in place

This step provides a sound basis for setting up the Register of Significant Environmental Aspects and for determining significant energy uses (SEUs). Information supports the defining of objectives for the Environmental and Energy Management actions.

EMS In place

The significant environmental and energy aspects can be reviewed, taking into consideration the new areas of significant NPO losses, costs and energy consumption and uses identified. On this basis, existing objectives can be reviewed within the Environmental / Energy Management action plans.

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Thank YOU for your Attention

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