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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P1.8 Action Plan

What measures to implement and monitor for improving company performance?

UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

switchmed

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Overview of Step 1.8

Inputs	Activities	Outputs
Savings catalogue (feasible measures) KPIs and OPIs already defined in the previous steps Elements of existing information on resource efficiency Information on existing incentives schemes for resource efficiency and environmental investments	Draft an action plan reflecting top management's decisions Select indicators for each measure in the TEST action plan and set up a cost effective way to monitor both consumption and driving factors of KPI/OPI Finalize the overall monitoring plan for resource efficiency as part of operation control Identify modalities for accessing financing for high investment needing solutions	Management commitment to implement selected measures and the information system on resource efficiency TEST Action Plan and Monitoring Plan

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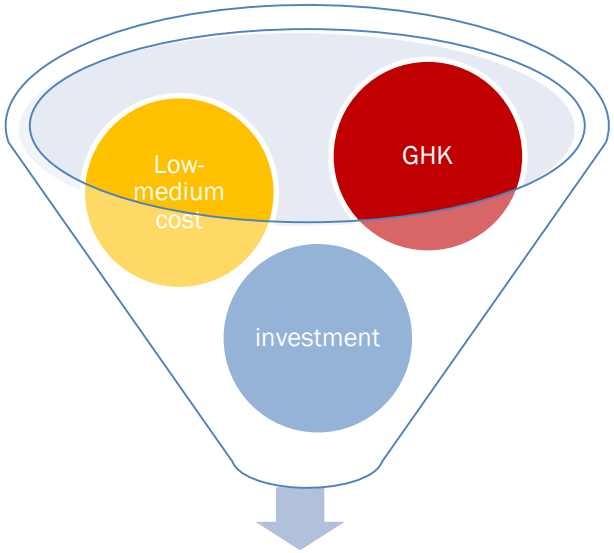
The process

Saving Catalogue

Company internal review



- Measures for implementation
- Measures retained for further study

Measures discarded

Keep Record !

Action Plan

From saving catalogue to Action plan

Typically discarded measures:

- Process integration (waste heat recovery)
- Water recycling for secondary grade applications
- Set points of processes requiring heating/cooling
- Process modifications

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Why feasible measures can be discarded?

- Too long PBP (company subjective)
- Conflict with other investment plans and company/corporate priorities
- Diffidence vs. estimated performance of new technology/solution
- Concerns about product quality (customers or standards requirements)
- Lack of financing

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Financing instruments

- **Internal financing:** Can be mobilized for measures with short payback periods and low to medium investment volume. Company must consider its situation and financing strategy, including all competing investment plans with more options for financing investments in resource efficiency and environmental protection.
- **Commercial loans:** Lending conditions vary depending on market conditions, client risk profile, and type of investment.
- **Soft loans:** Low interest rates and advantageous lending conditions. Access to these financial instruments is generally subject to restrictions linked to relevant country priority policy objectives, specific sectors/technology and size of industry. Access to soft loans sponsored by foreign governments is usually subject to additional restrictions related to a technology's country of origin.
- **Guarantee funds**: Provide collateral/bank guarantees at discounted fees to back up bank loans. These instruments were designed to support SME investment.

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Financing instruments

- **ESCOs financing**: An energy saving investment can be financed through a no-cure, no-pay arrangement from an energy service company (ESCO), which can provide a design for energy conservation measures and capital, equipment leases or energy savings guarantees to back up a bank loan. ESCO investment is repaid from energy savings (reduced energy bill).
- **Equity financing, seed funding, business angels**: Liquidity provided by private investors or investment funds against the acquisition of shares in company/assets value for a range of capital risks.
- **Industrial modernization and upgrade funds**: Usually consist of a mix of incentive instruments (grants on capital investment costs, soft loans, bank guarantees, etc.) to improve competitiveness of key industrial sectors though the acquisition of new technology and business skills.
- **Environmental funds**: Provide soft loans or grants for capital investment costs for the installation of end-of-pipe technology and/or cleaner technology.
- **Crowdfunding:** Emerging financing method for funding an investment project with relatively modest contributions from a large group of individuals usually based on an internet campaign. Campaign contributors can make donations, invest for a potential future return on investment (ROI), or prepay for a future product or service.

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Financing instruments

- Which financing instruments are available in your country for resource efficiency, energy efficiency, cleaner technology, etc..?

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FINANCING - EGYPT

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Instruments for RECP in Egypt

GEFF : Green Economy Financing Facility

EPAP III : Egyptian Pollution Abatement Project

Central Bank Initiative : Commercial loans with reduced interest for SMEs

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GEFF

- EBRD/GEFF in Egypt is a credit line facility of up to €140 million to participating financing institutions in Egypt to on-lend to businesses investing in energy efficiency and renewable energy projects.
- Minimum 20% savings in energy consumption to be eligible for grant.
- Following the implementation of projects, a grant of 10% or 15% from the loan amount is provided to the company, depending on the validated savings.

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EPAP III

- An initiative of the Ministry of Environment to help industry improve performance and comply with environmental regulations.
- The condition to apply through this program is to have a non-compliance with environmental regulations.
- Financing from 200 K Euro – 15 M Euro
- Cost share from company at least 10%.
- 10-20% from loan as a grant, 80-90% commercial loan.

Central Bank of Egypt Initiative for SMEs

- The CBE is supporting commercial loans to SMEs with reduced interest rate (5% for small enterprises, 7% for medium enterprises) instead of the high commercial interest rate.
- That initiative targets decreasing the pressure of commercial loans within the industrial sector in Egypt.
- Some commercial banks adopted the CBE initiative into Green credit lines (for example Green Fund from CIB)

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Financing - Tunisia

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Instruments for RECP in Tunisia

FODEP : De-pollution Fund

FNME : National Fund for Energy Efficiency

FODEC : Development Fund for promoting industrial competitiveness

ENVIROCRED : Environmental credit lines.

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FODEP De-pollution Fund

⇨ Subsidy of FODEP	20%
⇨ Loan of FOCRED	50% (or 0%)
⇨ Self financing	30% (or 80%)
TOTAL	100%

Note: The maximum investment in the framework of FODEP does not exceed **4 millions de Dinars** by company.

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FNME: National Fund for Energy Efficiency

Activity	Rate	Maximum
Energy Audit	70%	30.000 DT
Demonstration Project	50%	100.000 DT
Soft investments	70%	30.000 DT
Hard investments DT = Tunisian Dinars TEP = Ton of oil Equivalent	20%	• 100.000 DT (consumption below 4.000 Tep/yr) • 200.000 DT (consumption between 4.000 & 7.000 Tep/yr) • 250.000 DT (consumption above 7.000 Tep/yr)

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FNME: National Fund for Energy Efficiency

Activity	Rate	Maximum
Co-generation	20%	500.000 DT / Projcet
Renewable energy (wind and solar)	40%	20.000 DT
Biogas production	40%	20.000 DT
Electrical generation from biogas	40%	100.000 DT

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Financing - Morocco

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Industrial de pollution

FODEP: Funded by KFW + EC (25 M€) since 1998, provides grants for industrial de pollution, associated with bank loans. The financing scheme is as follow:

End of pipe solutions	Resource saving
40% : grant	20% : grant
40% : bank credit	40% : bank credit
20% : minimum self financing part	40% : minimum self financing part

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ANPME : Moussanada Fund

- This program implemented by the National Agency for Promotion of SMEs (ANPME) gives access to lines for financing the technical assistance to SMEs such (implementation of ISO Certification, financing of energy management systems, lean manufacturing..).
- This fund pay 60% of technical assistance cost for eligible companies (Turnover with less 175 MDHs)

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ANPME : IMTIAZ Fund

- This program IMTIAZ aims to support high growth potential companies with developments projects, through the granting of their investment.
- This fund provide to the selected companies (20% of their investment cost with a maximum of 5 millions MAD grants). This is a direct financial incentive to support SMEs with potential to achieve high levels of profitability and added value.
- This fund target 80 projects every year.

Others financing instruments

There is also some financial incentives on process, mainly:

- The energy fund: for energy efficiency audit financing
- The Environment National fund (FNE) is an incentive instrument to finance environmental protection in some specific area such pottery, craft, tourism
- The Clean Development Mechanism (CDM): International fund to finance eligible project to reduce the gas emission of Greenhouse Gas emission (GHC) in sector such Energy, industry,..

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TEST action plan

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The basics of Action Plans

Key elements of action plans

goals	Specify WHAT will be implemented and the performance improvements that will result
responsibilities	Specify BOTH who will coordinate & who will carry out specific tasks
resources	Identify the resources required for implementation
milestones	Set out specific implementation steps & WHEN they should be achieved
metrics	Specify how goals and milestones will be measured

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Action Plan

- Documented / formal
- Updated on a regular basis to verify progress on implementation
- Link each action/measure to objectives of the company policy statement

Tool - TEMPLATE

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What kind of measures does it includes?

- Resource efficiency measures (GHK, low-medium costs, high investments)
- Information system (MFCA recommendations, procedures, monitoring equipment, etc..)
- Operational procedures and working instructions
- Training of operators and employees

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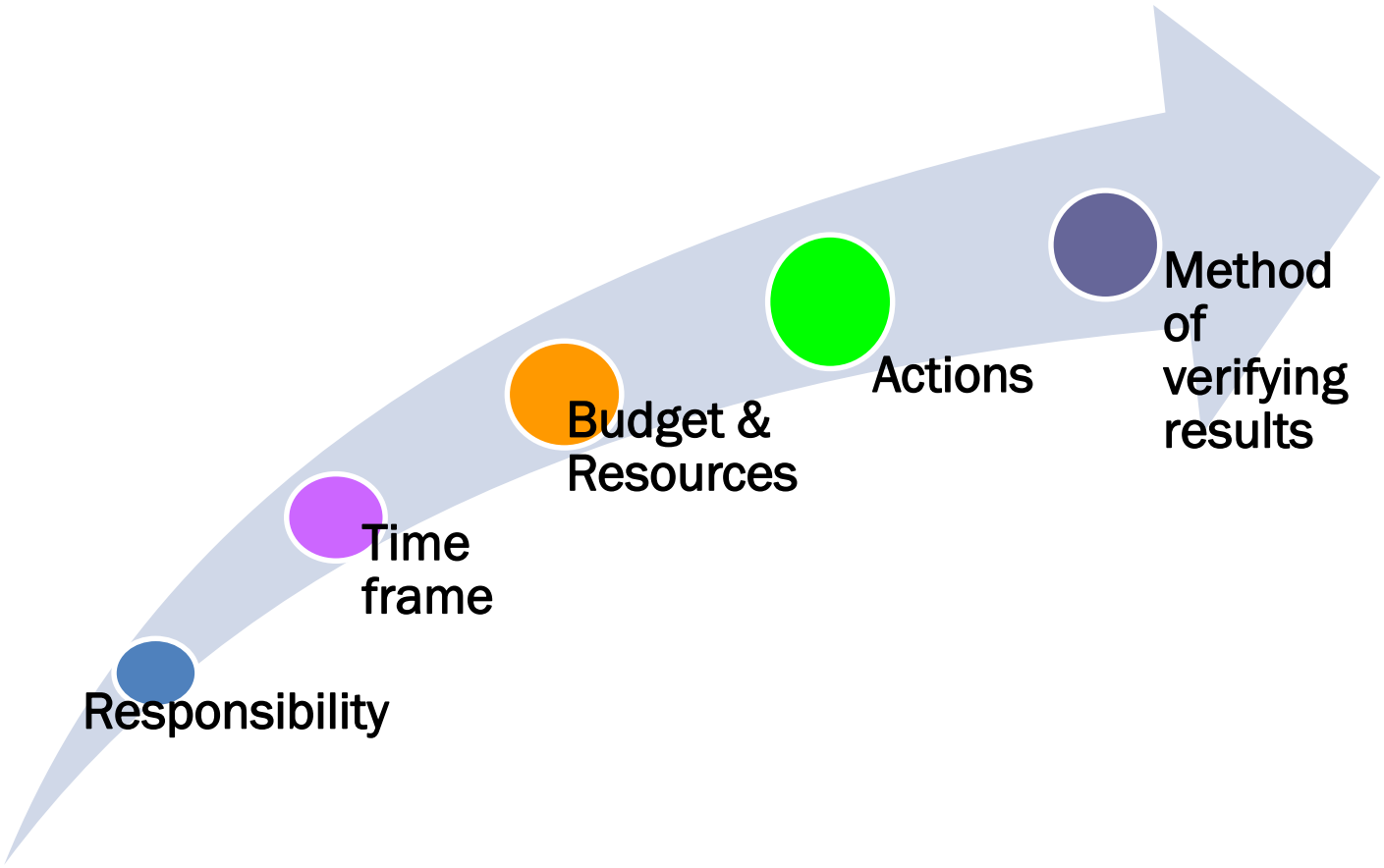
Action Plan



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Case study – rPET production

- During top management meeting **no/low cost** measures were quickly approved and implemented.
- One measure addressed **reducing the operating temperature** of the polymerization process. The management decided to further analyze this option by consulting with the technology supplier.

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Case study – rPET production

- Another measure addressed installing an automatic sorting machine to return the good bottles from the rejected stream back to the production. The company decided to **accept the concept behind the measure**, but implemented through hiring manual sorters instead of investing in a new machine.

- On the other hand, the company challenged the Team's recommendation to add a vacuum filter to the line processing the high grade raw material. This measure was **retained for further study**.

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Action Plan Example

No	Objective	Title of the Action	Responsible	Budget (EUR)	Category	Target / indicator	Accepted	Discarded	Retained for study
1	Secondary raw material supply	Import better quality PET bottles bales from Europe	Procurement & Quality	0	No cost	To increase ratio of good quality PET bottles to 50%	x		
2	Optimization of PET washing line bottle pre-treatment	Check efficiency of de-labeler/labels separator	Production	100,000	Investment	Reduce the loss of material after bottle sorting by 1%	x		
3		Reset the bottle sorters and set up new process parameters	Production	5,000	Low cost	Reduce the loss of input material by 0.7%	x		
4		Install an automatic third bottle sorting machine	Management, Operations & Technical office teams	80,000	Investment	Save 1% of the input material			x
5		Contact with bales supplier to eliminate cardboard sheet	Procurement	0	No cost	Eliminate cardboard waste			

Action Plan Example

No	Objective	Title of the Action	Responsible	Budget (EUR)	Category	Target / indicator	Accepted	Discarded	Retained for study
6	Optimization of PET washing line flakes production	Restart the vacuum filter when processing European bales of bottles	Maintenance	0	No cost	Reduce water consumption by 1 m^3/ton product			x
7		Adjust air flow of vertical air stream separator	Production	0	No cost	Reduce loss of good flakes from the air stream separator by 0.5%	x		
8		Check the size of the mesh of the sieve screen	Production	3,000	Low cost	Reduce loss of good quality material from the sieving table by 0.5%	x		
9		Install a re-sort channel on the Sortex flakes sorter	Operations & Technical office teams	20,000	Medium cost	Reduce loss of good quality material from the sorter by 1%		x	
10		Improve the separation of oil from the process water	Technical office team	150,000	Investment	Water savings by 2.5m^3/ton product Energy savings by 7%		x	
11	Adjusting the set points of the Solid State Polycondensation production line	Adjust the Polycondensation process temperature at recommended values. Combined with putting the vacuum pump of the degassing in function.	Maintenance	0	No cost	Save 4% of energy	X		

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Conclusion – Action plan setting

- Consultant's role in setting action plan is to provide technical justification for developed measures, as well as basis of calculations.
- The review of existing, or preparation of new, specific internal operational criteria and working instructions related to good housekeeping measures or to monitoring material and energy flow data and environmental performance should be included in the action plan.
- Training of enterprise staff is an integral part of the action plan to ensure that people involved in the implementation of the action plan are capacitated and motivated not only to implement particular measures and monitoring, but also to sustain their effects.

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TEST Monitoring plan

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Purpose of an information system on flows and monitoring plan

1. **Monitor overall enterprise performance** at the level of selected priority flows utilizing KPIs

2. **Measure the performance of key consumers** through OPIs, for:
   - understanding causes of inefficiency and implementing corrective measures
   - planning and setting up new targets

3. **Verify improvements in performance and savings compared to** expected benefits deriving from the implemented resource efficiency measures (TEST action plan)

4. **Make people** who influence resource efficiency and pollution generation **accountable** at all levels

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We can not manage what we can not measure

and we need to measure what does not exist: **savings**

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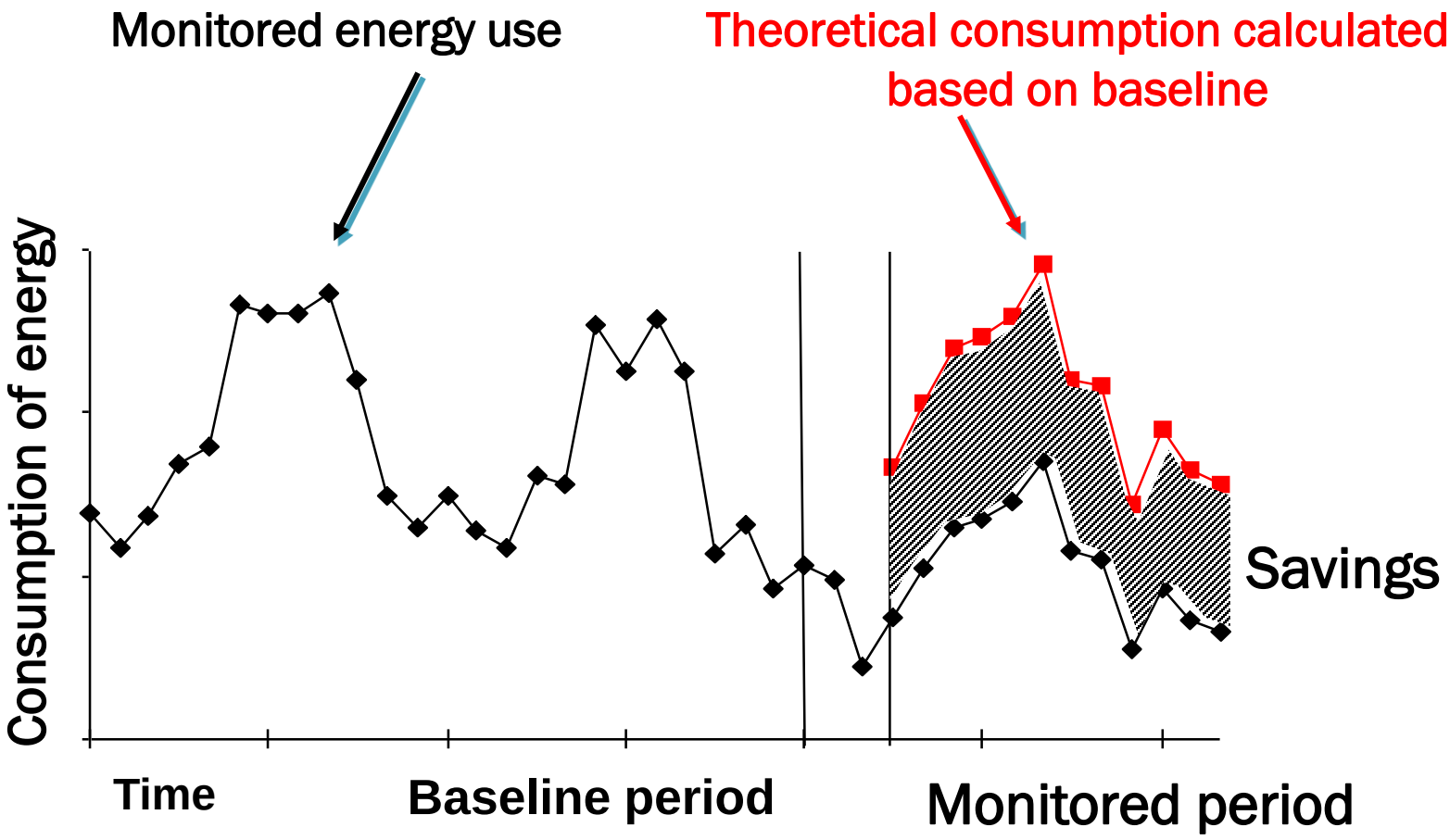
Importance of Baseline



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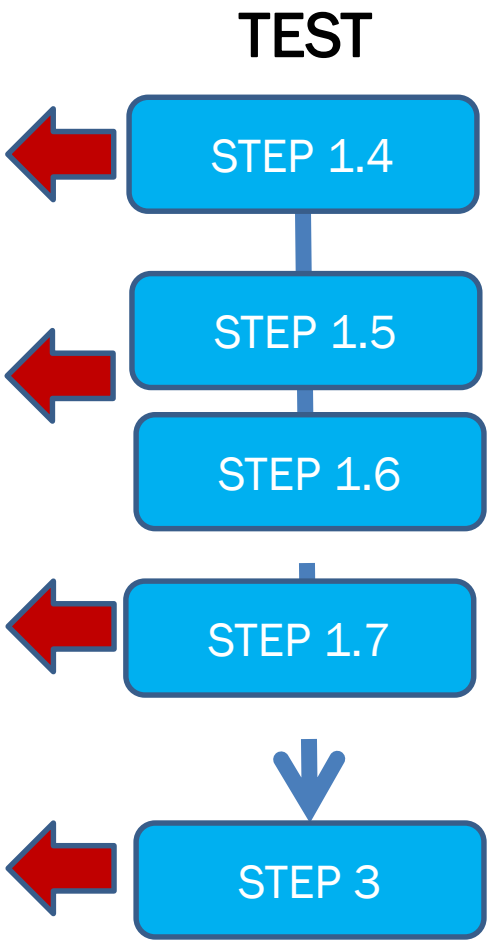
Where is our Baseline?

1. **Overall enterprise performance** for priority flows utilizing KPIs
2. **The performance of key consumers** using OPIs
3. **Calculation of the "expected" performance improvements and savings** within feasibility study
4. Verification of the **"real"** performance improvement



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Monitoring physical flows

Monitoring techniques should be driven by the potential for savings and common sense. Some examples:

Material flows

- traditional weighting methods
- calculation based on unit weight, the volume of the container, and its emptying frequency
- Install interfaces with accounting, production planning and stock monitoring

Water flows

- ultrasonic meters, turbine meters, rotameters and other meters,
- simple calculation method based on the volume of tanks (or of a bucket) and a stopwatch

Energy

- for electricity power clamps or standard electro meters
- heat flows can be monitored using different types of heat meters depending on the media (hotwire anemometers for air flows, infrared thermometers for surfaces, thermocouples for fluids)

TOOL – Monitoring Plan TEMPLATE

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Example of a monitoring plan

Title of the Action	Environmental Performance										Economic Savings [EGP]	
	KPI/OPI Description											
	Baseline	Planned Performance	Δ (Planned variation)	After implementation	Δ (Real variation)	Responsible for monitoring	Metering	Frequency	Reporting	Budget	Planned (Euro /year)	After implementation
Secondary raw material supply	50% oil bottles in bales	10%	40% less oil bottles			Operator	% oil bottles per input batch Share of each input batch in production batch	Per batch	Production Manager	-	310,275	
	Yield = 0.64 (Ton resin/ton input material)	0.658	2% additional yield			Operator	Input material weight Resin Production	Daily	Production Manager			
	Specific water consumption = 5.47 m^3/ton resin	5.34	0.13 m^3 less water/ton			Operator	Water consumption Resin Production	Daily	Maintenance Manager			
Check efficiency of delabeler/labels separator	Yield = 0.66 (Ton resin/ton input material)	0.67	1% additional yield			Operator	Input material weight Weight of removed labels and caps in delabeller Resin Production	Daily	Production Manager	100,000	153,000	
Reset the Tomra bottle sorters	Yield = 0.67 (Ton resin/ton input material)	0.673	0.7% additional yield			Operator	Input material weight Resin Production Good in bad	Daily	Production Manager	5,000	153,000	

Example of a monitoring plan

Title of the Action	Environmental Performance KPI/OPI Description										Economic Savings [EGP]	
	Baseline	Planned Performance	Δ (Planned variation)	After implementation	Δ (Real variation)	Responsible for monitoring	Metering	Frequency	Reporting	Budget	Planned (Euro /year)	After implementation
Check the size of the sieve screen	Rejects from sieving table 3.2%	2.90%	50 tons productivity gain			Maint.	Productivity per ton input	Weekly	Production manager		45,000	
Install a resort channel on the Sortex flakes sorter	Dust from Separator 2.8%	2.20%	100 tons productivity gain			Quality	Productivity per ton input	Weekly	Production manager		90,000	
Adjust the HAD, PDU process temperature at recommended values. Combined with putting the vacuum pump of the degassing in function.	Temp. setting 150 deg.	Temp. setting 130 deg.	5% less electricity			Maint.	Electricity meter Settings of temperature	Weekly	Maintenance		22,800	

Linkages with EMS

EMS
Not in place

- This step facilitates the development of operational controls for effective implementation of a resource efficiency action plan.

EMS
In place

- Existing EMS/EnMS documents can be reviewed to identify gaps and plan add-ons related to operational controls, including training and communication plans.

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Thank YOU for your Attention

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