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Energy Management and Sustainable Manufacturing (EMSM) Project in factories of industrial organizations - A Methodology - Requirements

EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Foreword

This CEN Workshop Agreement (CWA 18188:2025) has been developed in accordance with the CEN-CENELEC Guide 29 "CEN/CENELEC Workshop Agreements – A rapid way to standardization" and with the relevant provisions of CEN/CENELEC Internal Regulations – Part 2. It was approved by the CEN Workshop “A Methodology for the implementation of an Energy Management and Sustainable Manufacturing (EMSM) Project in factories”, the secretariat of which is held by Asociación Española de Normalización, UNE, consisting of representatives of interested parties on 2024-05-27, the constitution of which was supported by CEN following the public call for participation made on 2024-02-07. However, this CEN Workshop Agreement does not necessarily include all relevant stakeholders.

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Introduction

Efficient management and the use of limited resources have always been one of society's goals.

Supplying resources in a safe, reliable, economical and environmentally friendly manner requires using them efficiently. This efficient use drive increase efficiency of industrial process and in turn can increase the sectorial competitiveness.

Current energy and environmental policy pursue three main objectives: to ensure security of supply (through energy savings and diversification of sources), to increase the competitiveness of economies, to promote sustainability and to fight climate change.

This CEN Workshop Agreement pretends to contribute to these objectives. It takes as a basis the work done in ECOFACT Project, which is a project through the European Horizon 2020 Research and Innovation Programme under Grant Agreement Nº 958373.

ECOFACT aims at enabling manufacturing industries to optimize the energy performance (3.10) of their production systems in line with their relevant production constraints (time and resources), while at the same time introducing a novel green marketing approach through the concept of energy and environmental signature of the manufactured products from a life-cycle perspective.

Within the Project a range of Key Performance Indicators (KPI) have been identified and will be used as a tool. A Key Performance Indicator is a parameter or a value derived from parameters, which provides information about performance. As such, indicators are essential for measuring and monitoring sustainable performance in manufacturing to improving Europe's competitiveness on world markets with better use of raw materials, natural resources and renewable energies.

Therefore, a selection of indicators has been made to lay the foundations for an evaluation of the fulfilment of the objectives.

These indicators have been selected from different sources of information ranging from academic and industry reports or sectoral analysis to standards that include the energy, environmental, and resource management. The most important and most widely applicable ones have been chosen from the work done in ECOFACT Project. Some others have been taken form the work done in E2COMATION Project and the contributions from the WS participants.

The chosen Key Performance Indicators (KPIs) comply with the SMARTER principle; that is, they are specific, measurable, achievable, realistic, and time-bound. They are:

— Specific: representative of the operations.

— Measurable: through using adequate variables.

— Achievable: the measurement defined in the KPI can be implemented. In addition, collecting data for the KPI is not complicated or expensive.

— Realistic: give more information about the organization's performance to achieve its strategy.

— Time-bound: measure performance within a specific time frame.

— Effective: capable to represent main drivers in sustainability impact of industrial operations.

— Reproducible: able to be significant in other context.

In this document, the following verbal forms are used:

— “shall” indicates a requirement;

— “should” indicates a recommendation;

— “may” indicates permission;

— “can” indicates a possibility or a capability.

Information marked as “NOTE” or included in informative annexes is for guidance in understanding or clarifying the associated requirements.

1 Scope

This document specifies the requirements for a methodology (3.19) for the implementation of an Energy Management and Sustainable Manufacturing (EMSM) Project (3.22) in factories of industrial organizations.

NOTE It could be useful to benefit from the outcome of an energy/environmental/industrial auditor technological audit that might have previously been conducted in the factory organization, the baselines generated in the audit could be used as a reference for the Project.

This document is applicable to any EMSM Project implemented by any industrial organization, regardless its activity.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at http://www.iso.org/obp/

— IEC Electropedia: available at http://www.electropedia.org/

3.1
baseline
quantitative reference(s) providing a basis for comparison of performance

3.2
boundary
physical or organizational limits

Note 1 to entry: An example of boundary could be a machine, a group of machines or the entire facility.

3.3
Digital Twin Platform (DTP)
web application which acts as Energy and Resource Management System for factory organization managers and operators combining industrial digital twin models of production lines and machines with simulation and optimization tools into a single web environment

3.4
Dynamic Life Cycle Assessment (Dynamic LCA)
LCA considering time-dependent variations in environmental impacts of a product or process over its entire lifecycle

3.5
energy
electricity, fuels, steam, heat, compressed air and other like media

[SOURCE: ISO 50001] [47]

3.6
energy consumption
quantity of energy (3.5) applied

[SOURCE: ISO 50001] [47]

3.7
energy efficiency
ratio or other quantitative relationship between an output of performance, service, goods, commodities, or energy, and an input of energy

[SOURCE: ISO 50001] [47]

3.8
Energy Management and Sustainable Manufacturing (EMSM) Project
project implemented in an organization for the improvement of its energy and sustainable manufacturing performance (3.24)

3.9
Energy Management and Sustainable Manufacturing (EMSM) Project´s scope
set of activities, which an organization addresses for the improvement of its energy and sustainable manufacturing performance (3.24) in a given period of time

3.10
energy performance
measurable result(s) related to energy efficiency (3.7), energy use (3.11) and energy consumption (3.6)

Note 1 to entry: Based on ISO 50001 [47].

3.11
energy use
manner or kind of application of energy

[SOURCE: ISO 50001] [47]

3.12
environmental impact
change to the environment, whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects

[SOURCE: ISO 14001] [46]

3.13
Industrial Energy Disaggregation by Product
application of specific rules, requirements and guidelines (product category rules) for the obtention of separated information for each product regarding energy

3.14
Key Performance Indicator (KPI)
parameter, or a value derived from parameters, which provides information about performance

[SOURCE: ISO 24523:2017, 3.13, modified] [49]

3.15
manufacturing environmental aspect
element of a manufacturing activity that interacts or can interact with the environment

3.16
material-flow simulation
mass and energy balances simulation

Note 1 to entry: Usually is conducted by equipment.

3.17
normalization
process to enable analysis under equivalent or standard conditions

[SOURCE: ISO 50006:2023] [48]

3.18
measurement
process to determine a value

[SOURCE: ISO 50001] [47]

3.19
methodology
collection of standards, procedures and supporting methods that define the complete approach to the development of a project

3.20
monitoring
determining the status of a system, a process or an activity

3.21
process parameter
specified value for a process variable

3.22
project
temporary endeavor to achieve one or more defined objectives

3.23
sensitivity analysis
systematic procedures for estimating the effects of the choices made regarding methods and data on the outcome of a study

[SOURCE: ISO 14040:2006, 3.31] [39]

3.24
sustainable manufacturing performance
measurable result(s) related to social, environmental and economic effects due to manufacturing activities

4 Requirements for the methodology for the implementation of an Energy Management and Sustainable Manufacturing (EMSM) Project

4.1 Definition of improvement measures to be implemented

The organization shall define, in first place, the improvement measures to be implemented within a specific boundary (3.2) and their physical and temporal scope as well as the resources to achieve them.

When several of the identified improvements affect the same system (concatenation of improvements), they must be considered together to evaluate possible cross-effects.

When defining measurements (3.18) to be taken the impact that those measures may have in maintenance, operation and end of useful life of the facilities must be considered.

4.2 Technical study or preliminary project of the improvement measures to be implemented

A technical study or preliminary project for the implementation of the proposed improvements shall be available, according to the needs.

Technical studies or preliminary projects may include, when appropriate:

- Descriptive report;
- Installation schematics;
- Purchase specifications;
- Standards to be followed;
- Supplier guaranties;
- Budgets;
- Benefit/cost ratio;
- Conditions and deadlines for execution;
- Responsibilities and obligations;
- Consideration of possible necessary licenses.

4.3 Key Performance Indicators for the EMSM Project

4.3.1 General

The organization shall define their own KPIs (3.14) for measuring the improvements of the EMSM Project.

KPIs in 4.3.2, 4.3.3 and 4.3.4 are only a proposal. They can be taken as a basis.

They could also arise from audit/ baselines (3.1) previously obtained from technical approaches (see Annex A).

New KPIs referring to other industrial aspects and effects can be introduced when necessary.

NOTE 1 Reference period and demonstrating period may be different for different factories.

NOTE 2 Previous baselines may be operating in quality, environmental or energy management systems supported by ISO standards implemented in the factories of industrial organizations and be useful for identifying consolidated KPIs in factories. Besides, integrating simulation and optimization tools into a Digital Twin Platform (3.4) could enhance and improve the management in terms of energy (3.5), resources and costs.

NOTE 3 A Digital Twin Platform can be used, as an optional tool, to ensure a user-friendly monitoring (3.20) of field data KPIs, guaranteeing access to real-time data streams and historical datasets. Within the digital twins, advanced 3 D models of industrial plants and machinery, energy and resource IIoT devices are grouped by the parameter they monitor or type of meter.

As an example, a list of DTP parameters could be the following, among others:

- electrical energy;
- thermal energy;
- natural gas;
- compressed air;
- water;
- hot water;
- operating hours;
- operating percentages;
- control valve percentage;
- current;
- pressure;
- temperature;
- air meter data;
- air calometer data;
- chemical data.

Depending on the industrial scenario, the DTP could also offer one or more simulation and optimization tools:

- Energy flexibility: as a production optimizer it could schedule the weekly production of a line, reducing item changeover times (as a consequence less energy is used, while CO_2 emissions are reduced); as an energy optimizer it could schedule the thermal and electrical energy production, minimizing the energy bill and better managing the factory’s energy assets;
- Predictive Maintenance (PdM): could reduce maintenance costs estimating the Remaining Useful Lifetime of relevant equipment;
- Industrial Energy Disaggregation by Product (3.13): could forecast resource consumptions disaggregated by product;
- material-flow simulation (3.16): could generates a production forecast with the related energy consumption;

- production planning and scheduling: could minimize environmental impacts (3.12) through a simulated, improved production scheduling;
- Energy simulator: it could stimulate the behaviour of complex industrial processes (such as must cooling systems).

NOTE 4 Further software functionalities than an EMSM Project could include:

- Dynamic Life Cycle Assessment (3.4);
- Sustainable Production Planning;
- Energy Aware Optimization Planning and Scheduling.

Indicators shall consider three categories: Energy, Environment and Management and Use of resources.

4.3.2 Energy indicators

Table 1

KPI Name	KPI Definition	Units	Calculation Method
Energy consumption	Energy consumption per carrier (electricity, thermal… –gas, diesel, etc. –) and reference unit	kWh/reference unit	When available, measured data should be used for the different energy carriers. Otherwise, the energy consumption (3.6) value should be calculated based on the data available.
Energy savings	An amount of saved energy determined by measuring or estimating consumption, or both, before and after the implementation of an energy efficiency improvement measure, whilst ensuring normalisation for external conditions that affect energy consumption. (Source: DIRECTIVE (EU) 2023/1791 [50])	kWh/reference unit	Difference between baseline and real energy consumption adjustments
RES self-generation	The production of energy by renewable energy sources, for direct consumption by the same facility or system generating it	kWh or kWh/reference unit	When available, measured data should be used for the different energy carriers. Otherwise, the energy consumption value should be calculated based on the data available.

KPI Name	KPI Definition	Units	Calculation Method
RES share	The proportion of total energy consumption or production that is supplied by renewable energy sources	%	Renewable Energy Sources (RES) contribution to the total energy consumption
Load factor	The ratio of the actual energy consumed over a given period to the maximum possible energy that could have been consumed or at full capacity during the same period.	%	Average demand/peak demand
Average demand	The mean value of energy demand over a specified time period, calculated as the total energy consumed divided by the length of the time period	kWh	When available, measured data should be used for the different energy carriers. Otherwise, the energy consumption value should be calculated based on the data available.
Non Production Period (NPP) energy consumption	Energy consumption per carrier (electricity, thermal –gas, etc. –) and functional unit in non-production period of a production facility	kW	Measured and calculated energy consumption during NPP (kWh) / NPP (hours)

NOTE 1 In relation to the evaluation of energy in factories, an aspect that should be assessed is energy consumption.

NOTE 2 Depending on the availability of energy meters, the measurement can be provided on a general, line-by-line, or per-process basis.

NOTE 3 Measurement may also consider different types of energy, distinguishing, for example, by different sources: electricity, natural gas, diesel, etc. It would be ideal to distinguish by uses and/or systems and/or processes and/or areas.

NOTE 4 Energy costs are considered within 4.3.4, Management and Use of Resources Indicators.

NOTE 5 Manufacturing environmental aspects (3.15) of the different types (sources) of energy used in the industry are considered within the environmental KPIs, covering the entire life cycle of a product.

NOTE 6 A reference unit in the context of this document can be a quantity of final product, a quantity of raw material, i.e. waste used as an input for the process, a quantity of energy produced/consumed or others.

4.3.3 Environmental indicators

Table 2

KPI Name	KPI Definition	Unit	Calculation Method
Total environmental performance	Overall environmental performance	Dimensionless (Pt)	EF 3.1 single score (European Commission, 2022) [9]
	Total environmental costs	EUR	Environmental Prices (CE Delft, 2018) [10]
Global Warming Potential 100 years	Greenhouse gas emissions	kg CO_2 eq.	Baseline model of 100 years of the IPCC (based on IPCC 2013) (Myhre et al, 2013)
Water consumption[a]	The total amount of water consumed during the entire life cycle of the product	M3 World eq.	Available WAter REmaining (AWARE) as recommended by UNEP, 2016 (Boulay et al 2018) [11] [12] [13]
Energy consumption	Cumulative Energy Demand	MJ	Cumulative Energy Demand (CED) (Hischier et al, 2010) [8]
Resource consumption	Resource use, minerals and metals	kg Sb eq.	CML 2002 (Guinée et al., 2002) and van Oers et al. 2002. [14]
	Resource use, fossils	MJ	CML 2002 (Guinée et al., 2002) and van Oers et al. 2002. [14]
[a] Water consumption is included here from the perspective of the water footprint which includes upstream processes. Note the difference with the in-situ use of water as a resource at the manufacturing site.			

4.3.4 Management and use of resources indicators

4.3.4.1 Generic resource management and use indicators

Table 3

KPI Name	KPI Definition	Units	Calculation Method
Utilization Rate	The ratio between how many units a company produces over a period of time and how many units the company could potentially produce in that same period with optimal use of time and labour	%	(actual level of output) ÷ (maximum level of output) x 100 [17] [18] [22] (Utilizion efficiency [%])
Throughput	The average number of units being produced over a time period (having in mind raw materials or secondary origin such as waste materials)	Units/time	(units produced) ÷ (time) [17] [18] [19] [22] (Through put rate [Quantity Unit] / Time unit])

KPI Name	KPI Definition	Units	Calculation Method
Manufacturing Cycle Time	The total amount of time it takes to produce a product. The cycle time metric can be used to measure the time it takes to manufacture a completed product, each individual component of the final product, or even go as far as to include delivery to the end user. Thus, cycle time can be used to analyse overall efficiency of a manufacturing process on the macro scale, as well as determine inefficiencies on a micro scale. NOTE This KPI can be applied to an individual product or each distinct component involved in manufacturing. In cases where a single production line produces multiple products, the cycle time should be measured and reported separately for each product type to ensure accuracy and prevent double counting.	Time	(Process End Time) – (Process Start Time) [17] [18] [19]
Downtime to Operating Time	The effectiveness of machinery maintenance and the machine itself.	Time	(Downtime) ÷ (Operating Time) [19]
Availability	Availability is a ratio that shows the relation between the actual production time (APT) and the planned busy time (PBT) for a work unit.	%	Actual production time ÷ Planned busy time [22]
Effectiveness	Effectiveness represents the relationship between the planned target cycle and the actual cycle expressed as the planned runtime per item (PRI) multiplied by the produced quantity (PQ) divided by the actual production time (APT).	%	(the planned runtime per item x produced quantity) ÷ actual production time [22]

4.3.4.2 Manufacturing resources indicators

Table 4

KPI Name	KPI Definition	Units	Calculation Method
Demand Forecasting	The amount of raw materials they will require to meet future customer demand.	Raw Materials/t name	(Raw Materials) x (Production Rate) [19]
Inventory turns	How many times inventory is sold over a specific time period and helps indicate resource effectiveness. Low ratio numbers indicate poor sales and excessive inventory, while high ratio numbers represent strong sales or insufficient inventory	Inventories sold/time	(Units of Goods Sold) ÷ (Avg. Inventory) [19]
Worker efficiency	The worker efficiency considers the relationship between the actual personnel work time (APWT) related to production orders and the actual personnel attendance time (APAT) of the employee.	%	Actual personnel work time ÷ actual personnel attendance time APWT / APAT [22]
Comprehensive energy consumption	Comprehensive energy consumption is the ratio between all the energy consumed in a production cycle and the produced quantity (PQ)	Joule / (number of units) or amount	$e = E/PQ = (\sum Mi \times Ri + Q)/PQ$ where e: unit energy consumption of an equipment, E: comprehensive energy consumption Mi: actual consumption of certain kind of energy (kilowatt hour) Ri: conversion coefficient of certain kind of energy Q: algebraic sum of effective energy exchanges with the environment [22]
Water use strategy and management	The amount of water specifically consumed in situ during the production of a single reference unit.	m^3/ reference unit	Total water used at the single facility level divided by the reference units selected [20] [21]
Waste prevention and management	Total amount of waste generated during the production referred to a single reference unit	kg/ reference unit	Total waste generated (i.e. hazardous and non-hazardous) divided by the reference units selected [20] [21]

NOTE 1 Energy consumption has been considered as a resource in the production process.

NOTE 2 A reference unit in the context of this document can be a quantity of final product, a quantity of raw material, i.e. waste used as an input for the process, a quantity of energy produced/consumed or others.

4.3.4.3 Manufacturing quality indicators

Table 5

KPI Name	KPI Definition	Units	Calculation Method
Yield	The percentage of units that are produced the correct way and to the unit specifications the first time through the production line without rework	%	(Units manufactured properly) ÷ (total number of units that went through the company's production line) x 100 [18]
Scrap Rate	The percentage of material used that is not able to be used due to being defective or errors in the production process	%	(Amount of material that has been scrapped) ÷ (total number of material used) x 100 [18]
Overall Equipment Effectiveness (OEE)	The percentage of manufacturing time that is truly productive. An OEE score of 100% means you are manufacturing only Good Parts, as fast as possible, with no Stop Time NOTE In the language of OEE that means 100% Quality (only Good Parts), 100% Performance (as fast as possible), and 100% Availability (no Stop Time).	%	(Availability x Performance x Quality) [19]
Quality ratio	The quality ratio is the relationship between the good quantity (GQ) and the produced quantity (PQ)	%	Good quantity ÷ produced quantity GQ / PQ [22]

NOTE Production performance analysis is an important operational activity because it is part of product quality assurance. It includes analysis of production information, resource and equipment utilization, equipment performance, procedural efficiencies, and production variability.

4.3.4.4 Manufacturing costs indicators

Table 6

KPI Name	KPI Definition	Units	Calculation Method
Total Manufacturing Cost (TMC) Per Reference Unit	The total costs of resources involved in producing products including material, labour and overhead	€ €/reference unit	(Direct materials + Direct labour + Manufacturing overheads) ÷ reference units. [18]
Energy Cost Per Reference Unit	The total cost per carrier of energy spent over a period of time and divides it by the number of units produced in that time frame.	€ €/unit	(Total Energy Cost) ÷ (Reference units Produced) [19]

NOTE 1 By transforming financial and accounting data into KPIs, the industry can make sound business decisions.

NOTE 2 A reference unit in the context of this document can be a quantity of final product, a quantity of raw material, i.e. waste used as an input for the process, a quantity of energy produced/consumed or others.

4.4 Measurement and Verification Plan

The organization shall define and implement a measurement and verification plan.

For that, the organization shall:

— Establish the baseline for the KPIs selected in 4.3;

— Prepare the measurement and verification equipment;

— Identify a responsible for carrying out the measurements and calculations;

— Define and calculations and their frequency and implement them;

— Define and use a reporting document.

NOTE 1 The plan can be developed specifically for the Energy Management and Sustainable Manufacturing Project or come from protocols established by prestigious organizations.

NOTE 2 The implementation of the Measurement and Verification Plan will make it possible to know the degree of compliance with the objectives, providing information, where appropriate, of existing discrepancies and allowing the establishment of corrective measures.

4.5 Improvement analysis

The improvement shall be demonstrated comparing the reference period baseline (KPIs data prior to the improvement measures) with the demonstration period baseline (KPIs data after improvement measures). The comparison shall show better results in the energy management and sustainability manufacturing performance for the Project, using normalization (3.17) for the project, when necessary.

The organization must carry out the corresponding sensitivity analysis (3.23) to show influence that certain changes in the most influential variables of the reference period baseline have on the viability and results of the project.

NOTE The sensitivity analysis permits to foresee the possible economic risks assumed in the project.

See annex A.

4.6 Economic Approach of the EMSM Project

The organization shall approve an Economic Approach for the EMSM Project in order to demonstrate that the proposed activities are the most appropriate for achieving the economic and financial objectives of maximising benefits and minimizing risk.

The Economic Approach shall:

— contain all the necessary activities for the EMSM Project and the timetable for their implementation, in order to implement the measures and identify the real funding needs;

— include the main milestones of the EMSM, the time frame for achieving them, and interconnections with the rest of the activities and the time planning for their implementation;

— be technically, economically and financially feasible, realistic and credible, so that there are no barriers that prevent the execution of any of its activities;

— contain the financial projections that cover the entire course of the planning, implementation, development and operation, including any replacements and residual values; as well as sensitivity analysis related to the main variables.

NOTE 1 The Economic Approach justifies the expectations of success of the EMSM Project and it is essential to show the technical-economic-financial viability of the EMSM.

NOTE 2 The economical/technical approach may be used internally for the company's economic planning and externally to inform and engage third parties, such as banks, investors and public bodies.

4.7 Energy Management and Sustainable Manufacturing (EMSM) Design Document

Once, the organization has completed its EMSM Project, it must issue a Project Design Document providing information on the factory improvement for the established scope of EMSM Project (3.9), comparing the reference period baseline with the demonstration period baseline.

NOTE Benchmarks allow a fair comparison of factories, regardless of size, and that are applicable to a wide range of facilities. This is achieved by ensuring that only a single benchmarking methodology is required.

Information provided in the Project Design Document should be presented in a way that is verifiable by interested parties, including:

a) Definition of improvement measures.

b) Technical study of the improvement measures to be implemented.

c) Definition of KPI.

d) Measurement and verification plan.

e) Improvement analysis.

f) Economic approach of the EMSM Project.

Annex A
(informative)

Previous audit and baseline of a factory

A.1 General

It can be useful to conduct an energy/environmental/industrial audit in the factory organization prior to the EMSM Project that serves to define one or more baselines. Some of these baselines could be used as a baseline reference for the EMSM Project that the factory organization decides to implement.

A.2 Energy/environmental/industrial audit/survey

An energy/environmental/industrial audit/survey should provide information on the state and performance of facilities, facilities potential improvements, indicators potential improvements, impacts of the potential improvements on operation and maintenance, as well as the associated investments.

The physical and technical scope for the audit/survey to be conducted in the factory organization should be clearly defined.

In general, an energy/environmental/industrial audit in a factory organization should include the following stages:

a) Installation description;

b) Detailed inventory of equipment/processes/facilities/areas;

c) Assessment of the condition of the facilities;

d) Supply analysis;

e) Analysis of environmental impacts;

f) Processes analysis;

g) Analysis of horizontal and service technologies;

h) Data collection and measurement;

i) Energy, environmental and industrial accounting;

j) Mass/Energy/industrial resource balance;

k) Cost analysis of factory organization performance;

l) Analysis of improvement proposals;

m) Development of improvements;

n) Concatenation of improvements;

o) Recommendations and good practices;

p) Drafting of the audit/survey report.

NOTE EN 16247-3:2022 [46] provides useful information for conducting an energy audit within a process.

A.3 Baseline

Baseline(s) in an existing factory organization can be useful to establish performance levels prior to the accomplishment of a modification (Reference Period). This baseline(s) physically exists and is measured before possible changes within a EMSM Project are implemented. The reference model is able to accommodate changes in process parameters (3.21) and conditions so that “adjustments” are made.

On the flexible models of the company’s activities for which the results can be automatically updated based on changes in the input data, KPIs based on high-specificity models are tracked.

An EMSM Project thus can use previously developed relevant information of baselines already established in the factory organization, providing, transparency and rigor to the decision-making process of the improvement measures to implement within an EMSM Project.

It contributes also to generate the necessary confidence for the obtention of lines of aid of public or private financing for these improvements.

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