**Internal project material, PRESOURCE, WP3**

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**Guide for implementation of the**

**EDIT Value tool**

***Developed by ENVIROS with assistance of STENUM, ENEA and UBA***

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# Introduction

## Goal

Goal of the Eco-innovation Development and Implementation Value tool (EDIT) is to identify the most effective opportunities for improving Resource Efficiency (RE) and overall performance of sustainability of a Small and Medium-sized Enterprise (SME) within the given framework conditions. It enables a business to choose the most effective leverage points and feasible projects leading to improvement of RE for best allocation of their limited resources.

## Background

For optimizing actions in the field of RE it is important to review the whole system of a business in a consistent way. Within EDIT all levels of an enterprise are assessed in a systematic way from the perspective of possible RE opportunities for improvements which could enhance enterprise’s value. EDIT is based on a system approach which is operationalized by the management pyramid. Management pyramid is describing different system levels of a business:

* Physical levels:
  + products
  + processes
* Information level:
  + management systems
* Governing levels:
  + strategy
  + stakeholders

At these system levels can be identified the leverage points for improving RE. By focusing on potentials within these levels EDIT is identifying the most effective RE innovations and projects for the given company. As RE is influenced by all levels of a business it would be not sufficient to evaluate the physical levels of an enterprise only. The core theory behind EDIT is explained within the ANNEX 1 which provides brief description of management pyramid and relationship of tools for improvement of RE.

## EDIT approach

The main feature of EDIT is the holistic need driven approach which is manageable at the SME level. In contrast to other methodologies for a complex diagnosis in the field of RE and sustainability of industrial enterprises EDIT has the following advantageous features:

* EDIT provides a complex review thus not omitting any significant opportunity for improvement
* EDIT is based also on quantitative analysis thus pointing out the most effective priorities and setting up baselines
* instead of comparing assessed enterprises with an ideal “sustainable site” assuming that all RE tools should be utilized (as other similar tools do), EDIT focuses on opportunities for improvements and innovations within the given enterprise first; suitable tools for improvements and innovations are assigned to these opportunities only after completion of this initial analysis (thus ensuring a need driven, SME tailored approach).

## Benefits

Major benefits of EDIT for SMEs include:

* New view on business effectiveness and efficiency
* Identification of most interesting areas for improvement
* Proposals of innovation projects bringing double benefit of RE - costs savings and reduction of environmental risks at the same time
* Better control over strategic risks and opportunities
* Involvement of enterprise staff in continuous improvement of enterprise performance
* Increase of enterprise value

## Steps

Particular steps of EDIT include:

**0) Preparation**

This preparatory step includes selection of suitable SME for implementation of EDIT, collection of initial information and approaching a SME.

**1) Potentials**

EDIT implementation starts by identifying RE potentials which are most interesting for exaploration by a specific SME within its given framework conditions.

**2) Applications**

Allocation of the most effective applications (specific eco-innovations, techniques, tools and/or their parts) to the potentials identified within step 1. Cost benefit analysis.

**3) Action plan**

Planning the most effective projects in the field of RE including their financing.

Steps of EDIT provide structure to the following step by step guide. Each step is illustrated by a practical case within the EDIT training. This case description can be considered to be part of the guide as well.

# Preparation

This “zero” step provides guidance how to initiate and prepare for EDIT implementation within an enterprise.

## Who should implement EDIT

EDIT can be implemented also directly by the enterprise members, however, we strongly recommend to utilize an external assistance for launching the EDIT approach within an enterprise. An external assistance is very important here in order to have the necessary independent view on enterprise performance, however, experience with implementing RE applications is important as well. EDIT has a dialogue nature as it is based on asking the right questions. This task can be managed most effectively from an external perspective for example by:

* an external facilitator
* independent expert
* coach

If an external technical assistance is provided, enterprise members should be involved into EDIT implementation as much as possible, not only to be the necessary partners in the EDIT dialogue, but also to have the learning experience leading to continuation of processes started by launching the first EDIT cycle. By the EDIT cycle i smant a full application of the tool, which can be utilised repeateadly to achieve a continuous improvement. This corresponds to the PDCA learning cycle as known for example from the managemant systems.

An optimal arrangement for EDIT implementation is guidance provided by an external expert to an EDIT team established within the enterprise. This team should include enterprise management members and staff with knowledge about enterprise products, processes and systems.

## How to select a suitable enterprise

EDIT is suitable for SMEs which influence use of natural resources through any phase of life cycle of their products. As all SMEs are influencing use of natural resources through operation of their production processes and/or through provision of their service, they can also possess a potential for improvement of RE. The question is only if this potential is worth to be explored. Resource intensive products and processes go hand in hand with higher RE potential, however, we can recommend to implement at least the initial steps (input- output analysis (see form 1.2)) and indicative life cycle analysis (see form 1.3)) in any site as this relatively simple collection of basic data on possible significant flows will already answer the question of general relevance of RE efforts for a given business. General criteria for selection of an enterprise suitable for implementation of EDIT are:

* Commitment to increase RE
* Willingness to collect and provide data on aspects influencing RE within the whole business

As already explained the magnitude of RE potential does not provide criteria on its own as specification of this potential is one of the outputs of EDIT and can bring surprising results (conviction of an enterprise that its RE potential is not significant should be not a reason for refraining from EDIT on its own).

## Preparatory activities

General information about the target SME can be collected through internet sources and other publicly available sources of information. This information can be utilised also for checking financial health of an enterprise.

It is recommended to collect general information on RE potentials within a given branch.

Provider of technical assistance should become acquainted with specific processes and products and their RE aspects.

Contact enterprise in order to understand its perceived needs and to tailor presentation of EDIT to these needs. Specific characteristics of EDIT and its outputs which can be utilised within this marketing phase are presented in section 1.4.

There can be prepared a small report with tailored offer based on initial information collected. This report can be structured following particular levels of the management pyramid (described in Annex 1).

## Agreement on implementation of EDIT

Some enterprises could have a wish to “pilot” EDIT at some specific process first. We cannot recommend such a partial approach as purpose of EDIT is to select priorities for RE within the whole business. An initial analysis cannot be completed with partial data only.

Implementation of EDIT requires on one hand some detailed data on enterprise processes, products and flows and on the other hand information on enterprise relationships, strategies and management systems etc. Therefore an agreement on confidentiality of data will be usually an important part of agreement on external assistance here.

This preparatory step is terminating by making agreement on implementation of EDIT (usually by signing a contract).

# Potentials

The first step of implementing EDIT is a systemic identification of potentials for improvement. This is the core step of EDIT and provides basis for its value added. It starts with collection of data and focus on their analysis in dialogue with an enterprise.

Steps for collection of data are provided in a recommended order here having their internal logic (for example we can use data from step 1.2 for implementing step 1.3).

Identification of potentials is done through a complex set of aspects which can be source of potentials for improvement. All these aspects are listed within 1.4 form which creates a backbone of EDIT. EDIT methodology is straight forward in ”switching off” those aspects with no or little potential within the form 1.4. Only those aspects which can posses a significant potential for improvement are further explored within the step 2 where they are assigned the right applications.

Some important data needed for working with the 1.4 form are collected through forms 1.1, 1.2 and 1.3.

## Stakeholder analysis (form 1.1)

We propose to start with stakeholder analysis in order to better understand enterprise goals and consequently also strategy, how an enterprise reflects interests of stakeholders on which is based its business. Gap between the importance of a given stakeholder and reflection of this significance in enterprise activities and communication provides basis for the first “aha” effects. Goals and strategies developed from expectations of stakeholders represent the first source of RE performance and enterprise relationship with stakeholders and relevant gaps in addressing this basic level of a business should be therefore reviewed thoroughly.

You can utilize the 1.1 form to implement this initial analysis. It contains among others a checklist of the most important stakeholders not to forget any important one. To work with this form you can either organize a workshop with enterprise management (one hour workshop with a follow up discussion can be sufficient) or to get form 1.1 filled in individually and to compare and discuss results with enterprise representatives as follow-up.

Outputs of step 1.1 form provide input into working with 1.4 form.

## Input output analysis (form 1.2)

This step of EDIT enables to estimate theoretical potential for RE within processes through a simple input – output analysis implemented at the enterprise boundary level (not at the level of specific processes). It easily estimates total losses related to inefficient use of natural resources within the processes (so called Non Product Output costs).

Data on major process inputs (materials and auxiliaries, water and energy or packaging) and estimation of ratio of their appearance within the desired product is needed at this stage. These data are collected using the form 1.2 “TOP 20” based usually on annual figures from the previous business year.

The result of this input – output analysis is a quantification of “total loss” which at the same time represents:

* natural resources which were wasted
* financial losses
* pollution and harmful substances that have an impact on the environment.

This provides:

* Indication of potential for improvement of RE and pollution prevention
* Information for identification of priority flows and areas for improvement
* Data for quantification of an initial baseline and for possible target setting

Results therefore provide an important insight into efficiency of the use of input materials, total costs of pollution and provide background information for estimation of potential for improvement.

Data gathered within TOP 20 together with data on annual production can be in some cases used for benchmarking, which can provide further insight into the quantification of the potential for improvement.

This quantitative analysis is also testing enterprise ability and willingness to provide quantitative data necessary for identification and exploration of RE potential.

Results of this simple analysis are often surprising for the enterprises which are seldom used to monitor losses related to production of waste and pollution (Non Product Output costs). This information can be therefore often utilized also for boosting commitment for change at the enterprise level as it brings the mentioned “aha” effects related to real costs of pollution.

Note that TOP 20 is designed for priority setting and it is not a comprehensive and complex input – output analysis. It is done only for most significant inputs within the company system boundary and does not include for example costs of pollution treatment (this simplification is possible as these aspects are usually not as significant as the costs of input materials and are investigated within the next steps of EDIT, especially within the cost-benefit analysis within the step 3).

Also there is one important rule to be considered: Ask for (even very rough) expert estimation if real data are not available or cannot be gathered easily. It is better to be “approximately right than accurately wrong”. This is valid especially for estimation of ratio of appearance of selected inputs within the product. For priority flows the missing data will be collected later with needed accuracy.

Labour intensity for filling in form 1.2 can vary from company to company. If data on major inputs are available it should not take more than half a day to implement it.

Outputs of 1.2 form provide input into working with forms 1.3 and 1.4.

## Life cycle analysis (form 1.3)

Also this indicative analysis of the life cycle of enterprise product(s) and/or services provides input into working with 1.4 form. The number of product related aspects within the form 1.4 is high and analysis within the step 1.3 can significantly reduce number of aspects which will be further investigated. One output of the work with the 1.3 form is “switching of” aspects within 1.4 analysis at the product level in order to further investigate only areas with a possibly significant potential for improvement.

It here is more than one product / service SME is providing it could be needed to decide for which product should be the analysis done. It is possible to select for the analysis the most representative product only or to implement it for more product groups etc.

Important source of information for filling in 1.3 form can include the following:

* First guidance can provide significant material and energy flows identified within analysis 1.2 which are entering also the other phase of the life cycle and which can provide basis for quantification of selected inputs and outputs at specific stages of the life cycle. This is especially valid for the major inputs identified within 1.2 as these can provide a link with possible RE potential within production and transport of input materials.
* In order fill in question on the upstream life cycle phases it is possible to ask questions on composition of product and its performance within use phase (if it consumes energy etc.) or within the end of life phase. At this stage is sufficient to mark areas with possible potential only, more detailed questions related to such an area (like recyclability of materials etc.) will be asked within the 1.4 form later.

While it is possible to quantify all items within 1.2 form, life cycle analysis within 1.3 can be done with qualitative estimations only. The goal of working with the 1.3 is to mark areas with possible potential for improvement of RE or reduction of environmental and/or social risks. This analysis can be implemented within 90 minutes discussion and/or workshop with knowledgeable enterprise members, however, there can be identified need to collect additional data.

Even if SME is not an owner of a specific phase of the life cycle (cannot influence it), it is still worth to indicated possible potential within 1.3 and consequently to ask questions within 1.4 as there can be a possibility to influence these potentials though changes within some other phases of the life cycle.

Some inspiration for filling in form 1.3 can come also from form 1.1 as stakeholder interests influence also stages of the life cycle.

There is one general remark: It is possible to come back to specific forms with more accurate data later, however, EDIT is an action oriented tool and we should prevent to get through a too detailed analysis to paralysis. Please, do not forget we are still at the sage of priority setting and “switching off” areas with no limited potential for improvement. More detailed and time consuming data collection is appropriate within the cost-benefit analysis within the step 3.

## Walk through

In many cases the walk through the enterprise will be implemented at the beginning of implementation of EDIT (or even already before signing the contract on implementing EDIT with an external assistance). We recommend to implement a new walk through after the data from form 1.2 are available. This enables to focus within the walk through on RE of the most significant flows identified within 1.2.

Walk though should be planned. Technological scheme provides a basis for planning its physical part, it is possible to utilize it for recording the main findings and later also for reporting. A simple technological scheme can be drawn also into a plan of enterprise facilities.

The walk through should be implemented in time of enterprise operation. It is recommended to follow logic of material and energy flows if possible. Do not forget to keep all health and safety rules. External expert should be accompanied by responsible staff of an enterprise. We will need some knowledgeable people to be available at the core processes and/or machines.

**Within walk through the enterprise processes you can pay special attention to:**

* + main process inputs
  + production technology and its efficiency (major processes and quality of technological equipment)
  + way of operating technology (good housekeeping, maintenance, ratio of rejected product outputs) and its maintenance
  + end of pipe technology and its efficiency and maintenance
  + major material and energy flows (you can follow the major inputs and outputs and try to indicate major pollution sources, ask for composition and origin of waste) and their monitoring (are significant resource users monitoring also driving factors of specific flows in order to manage resource efficiency?)
  + logistics with focus on storage
  + any significant risks within environment, quality and health and safety.

Specific attention should be paid to water and energy flows in order to become acquainted with their intake (energy production), distribution and final use.

Walk through can provide an empirical material for evaluation also of other aspects of enterprise operation listed in form 1.4.

## Summarising potentials for improvement

It can be important to summarise findings concerning potentials for improvement identified within the previous steps. Here is an opportunity to do so and you can utilise worksheets 1 and 2 "Quantification of potentials" here.

You can provide an expert estimation of potential for improvement related to increase of efficiency and to reduction of pollution within processes (TABLE 1) and within the life cycle (TABLE 2). This estimation can be qualitative.

***TABLE 1: Potential for improvement of RE within processes***

|  |  |  |
| --- | --- | --- |
| **Flow** | **Potential** | **Observations** |
|  |  |  |
|  |  |  |
|  |  |  |

As a starting point for filling in TABLE 1 utilise form 1.2. Within the processes it is possible to comment if there is a potential for improvement through good housekeeping or cleaner technology.

***TABLE 2: Potential for improvement of RE within product life cycle***

|  |  |  |
| --- | --- | --- |
| **Flow and phase of life cycle** | **Potential** | **Observations** |
|  |  |  |
|  |  |  |
|  |  |  |

As a starting point for filling in TABLE 2 utilise form 1.3. Useful questions which can be asked here include:

* To which extend is design of products influencing RE within the processes (do not forget to question especially use of hazardous materials and water pollution)?
* To which extend is design of products influencing RE within the other stages of the product life cycle?
* Can be there a potential for reduction of pollution and costs through improved product design?

## Identification of potentials (form 1.4)

Step 1 is ending by identification of areas with possible significant potential for improvement. This important work which represents a core activity of the EDIT tool, is guided by the form 1.4.

There can be different strategies how to work with form 1.4. Experienced professionals will utilise it only as a checklist if they did not forget to ask all important questions. It is recommended to start with discussing relevance and importance (evaluated by the weight) of specific aspects. Importance can be understood either as general importance of given area for the given enterprise and/or as a general level of potential for increase of RE or for gaining any benefits from better performance of a given aspect.

Fill in relevant evaluation (relevance and A, B, C for weight) within each aspect. This will lead to “switching off” the not relevant and not significant (evaluation C) aspects from further investigation.

Specific potentials for improvement can be highlighted for each aspect within the next stage of working with 1.4 form. This is done by assigning level of exploration of potential for improvement within given aspect (values 1 – 4).

The aspects scoring A1, A2 and B1 can be in general considered to be areas for improvement for further investigation. It is important to notice that these values serve only for orientation of those who do this evaluation. Final selection of aspects with RE potential is fully on their expert judgement and result of discussion which will evolve especially around the “problematic” aspects.

Output of this step is specification of significant aspects. These are areas for improvement possessing an interesting RE potential for further investigation. Final selection of significant aspects should be always output of a team work. The dialogue nature of EDIT is embedded especially within this step.

# Applications

Within this step are to the potentials identified within the step 2 allocated the most effective applications building on

* knowledge of leverage points (aspects with potential for improvement) within the management pyramid
* knowledge of relevant applications
* the cost benefit analysis.

## List significant aspects

List aspects with significant potential from form 1.4 (for example evaluated as A1, A2, B1 as already described within section 3.6).

## Long list of applications

Typical applications addressing specific levels of the management pyramid are characterised within ANNEX 1.

For the first indicative allocation of applications can be utilised recommendations within form 1.4.

Do expert allocation of possible applications.

Question for discussion within the PRESOURCE team: Should we Utilise description of applications on PRESOURCE website ??? – THERE IS AN OPTION TO INTEGRATE DESCRIPTION OF SPECIFIC APPLICATIONS WITHIN THE PRESOURCE WEBSITE SO THAT THIS INFORMATION IS ALLWAYS UP TO DATE.

## Company feedback

Scope of the potential projects to be evaluated further can be best defined in discussion with an enterprise. You can discuss specific proposals (applications in form of specific innovations, application of RE tools and/or their parts etc.) with enterprise members and develop long list of applications (projects).

This step can be effectively integrated with steps 4.4 and 4.5 depending on nature of applications and their expected feasibility.

## Feasibility study

For selected applications should be implemented technical, environmental and economic feasibility study. this section contains basic information for evaluation of the technical and environmental aspects of planned project, economic feasibility is characterised within the next section 4.5.

Within the technical feasibility can be considered influence of identified application on

* product quality
* productivity
* choice of inputs and material consumption
* energy consumption (availability)
* maintenance
* safety

Within the environmental feasibility can be considered influence of identified application on

* use of natural resources - material consumption and energy consumption (within energy consumption is considered also water consumption)
* emissions to air, water, soil
* shift of environmental problems to other media
* substitution of harmful substances
* health and safety
* life cycle impacts if any

Applications which are not technically and environmentally feasible should be not evaluated further.

## Cost benefit analysis

For technically and environmentally feasible applications should be implemented cost benefit analysis.

Relevant costs and benefits can be linked to:

* material and energy flows and their changes (including change in quality)
* change of technology (from small amendments to a complex modernisation, do not forget to consider also costs of installation)
* maintenance
* labour
* monitoring and information system
* transport
* compliance

We need to transfer all costs and benefits to a common unit of measurement which will be in our case money value.

The very basic criteria for economic evaluation of applications is payback period. Pay back is period of time (in years) needed to generate enough cash flow to recover the initial investment.

Payback period (years) = capital investment / annual cost savings

Expression in equivalent money value does not have to be sufficient for evaluation of applications as value of money changes over time (an Euro available five years from now is not as good as an Euro available now) and we should work with the interest rate in order to get better picture for more significant investment projects. For low investment projects could be utilised simple payback period.

We can further discuss expansion of this section (for example to NPV, IRR or sensitivity analysis) with Fraunhofer.

Select feasible applications / projects in dialogue with enterprise. Selection of feasible applications and formulation of specific projects should be done again in dialogue with enterprise members. Enterprise should have the right of veto within all discussions. The only way to convince its members on usefulness of some applications are solid arguments and data.

# Action plan

Final output of the EDIT is the implementation plan for selected applications (projects).

After defining the feasible projects for improving enterprise RE these should be integrated into the Action plan. Action plan can be simple as proposed within the table 3.

**TABLE 3. Action Plan**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| ***Action (what)*** | ***Justification (why)*** | ***Responsibility (who)*** | ***Schedule (when)*** | ***Budget (source of financing)*** |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |
|  |  |  |  |  |

For investment needing measures identify also possible sources of financing

The appropriate performance management and measurement framework should be established building on specific performance indicators. Make sure that you are using the most effective indicators which are feasible for given SME. Performance measurement system should be embedded into the business activities. For more significant projects can be developed monitoring and verification plan not only to keep control over the real RE but also to show enterprise internal and possibly also external stakeholders what an enterprise implemented and what results were achieved.

# ANNEXES

## ANNEX 1: Relationship of tools for improvement of resource efficiency

## ANNEX 2: Terms and definitions

## Form 1.1

## Form 1.2

## Form 1.3

## Form 1.4

## Worksheets for quantification of potentials

## ANNEX 3 Basic information on an enterprise

ANNEX 2

## Terms and definitions

## ANNEX 3

## Basic information on an enterprise

|  |  |
| --- | --- |
| Company name |  |
| Address |  |
| Contact person(s)  Contact detail(s) |  |
| Ownership & legal form |  |
| Year of foundation |  |
| Industrial Sector |  |
| Product(s) |  |
| No. of employees |  |
| Turnover (previous 2 years) |  |
| Hours of Operation (monthly/yearly) |  |
| Location |  |