CONNECT & CREATE

RECP Navigator

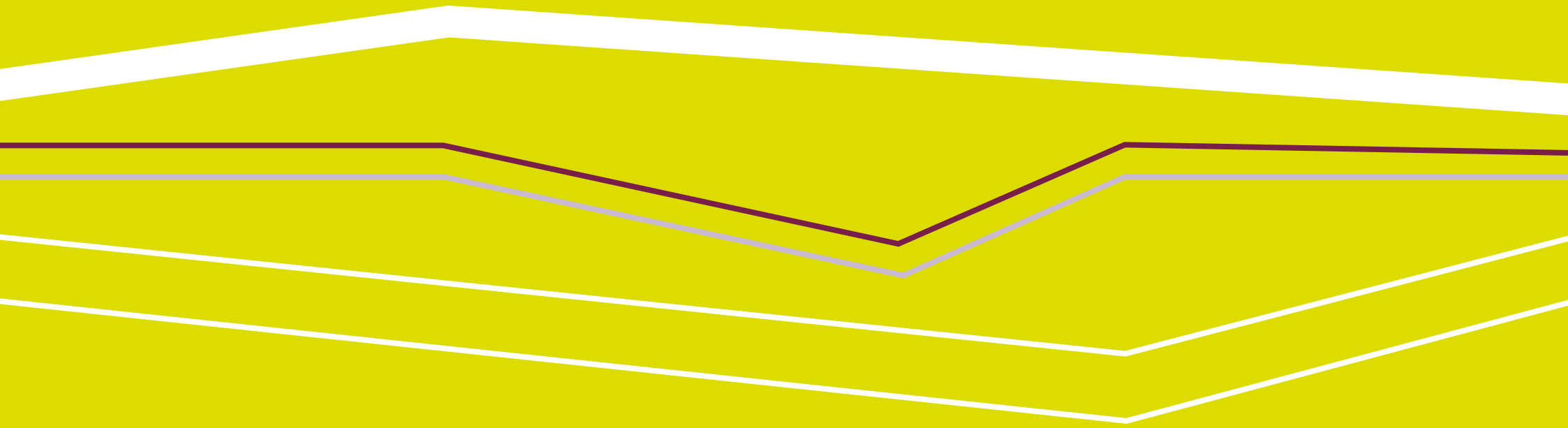
Instruments for supporting ressource efficiency and cleaner production in SMEs

giz Deutsche Gesellschaft
für Internationale
Zusammenarbeit (GIZ) GmbH

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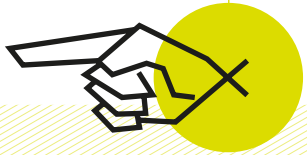
INTRODUCTION

1 Introduction

ABOUT THIS NAVIGATOR

This Navigator is meant for development professionals working in small and medium-sized enterprise (SME) development. It aims to …

- inform development professionals about the relevance of resource efficiency and cleaner production (RECP) and about existing instruments to support it
- support project staff in choosing the right instruments for their specific needs and circumstances
- give important hints and recommendations on what to be aware of when setting up and managing a programme for supporting RECP in SMEs



In the first part of the Navigator, you will learn about the RECP **concept**, the **benefits** of – and also **challenges** related to – RECP for SMEs, as well as the evolution of approaches and instruments for supporting RECP in the past fifty years.

The second part displays six selected RECP **instruments in detail**, including some implementation **examples from GIZ** projects in India, Armenia, Ethiopia and Jordan. The chapter provides an overview table in the beginning and summarises the results to be achieved with RECP instruments at the end of the chapter.

A large array of **hints and recommendations** on what to be aware of when designing and managing an RECP instrument in your project are listed in the third part. These – just as the information in the other parts – have been collected through an in-depth review of the available literature, interviews with experts and projects staff working with RECP instruments and own experience of the authors.

If we want to achieve a 'Green Recovery' following the Covid-19 pandemic, approaches to strengthen resource efficiency and cleaner production must play an important role in German Development Cooperation.

"To avoid overburdening of ecosystems and to use non-renewable resources in such a way that future generations will still be able to draw on them, it is necessary to establish a comprehensive circular economy, including an increase in resource efficiency, in order to benefit the three dimensions of sustainability."
15th Development Policy Report of the German Federal Government, 2017

"We need a radical rethinking in the global economy to better protect people and nature. (...). The Corona crisis is a wake-up call for all of us: we must not return to the normality of the old globalisation."
German Development Minister Gerd Müller, Earth Overshoot Day 2020

WHAT IS RESOURCE-EFFICIENCY AND CLEANER PRODUCTION?

There are various definitions of resource efficiency and many terms and concepts have been used to describe it, including resource productivity, the 3 Rs (Reduce, Re-use & Recycle) and circular economy. However, all these terms and concepts share two common goals: to decouple economic growth from environmental degradation and to improve the wellbeing of mankind. A commonly used definition by the European Commission says:

> "Resource efficiency or resource productivity can be defined as the efficiency with which we use energy and materials throughout the economy, i.e. the value added per unit of resource input."[1]

Cleaner production (CP) is a preventative, environmental management strategy. It promotes the elimination of waste before it is created. This systematically reduces overall pollution generation and improves the efficiency of resource usage.[2]

The concept of circular economy entails keeping materials and products in circulation for as long as possible. To achieve this, practices such as repairing, recycling, re-manufacturing and re-using products, and the sharing of underused assets are used. Circular economy also encompasses restoring natural systems, designing out waste and substituting non-renewable with biological and renewable materials. The circular economy is in stark contrast to the current linear economic model, where resources are extracted, transformed into products, used and finally discarded. This is a model that is characterised by the inefficient use of resources, large amounts of waste, and missed opportunities to retain the value of materials and products.[3]

The concept of circular economy describes the entire process, from product design and production to the consumption and re-usage of a product or service. The concepts of RECP are embedded in this process and are particularly focused on increasing efficiency and reducing waste in the production and distribution of a product or service.

Increasing resource efficiency has massive potential – it can be used as a cost-effective method of protecting resources, tackling climate change and reducing our environmental footprint, and in doing so, it also boosts economic growth and employment. Resource efficiency is an opportunity to achieve the climate change aspirations expressed in the Sustainable

1 EU-COM 2003:9, EU commission
2 UNEP (2001) International Declaration of Cleaner Production
3 Research Paper Patrick Schröder Energy, Environment and Resources Programme | April 2020 Promoting a Just Transition to an Inclusive Circular Economy

Development Goals (SDGs) and the Paris Agreement. Natural resources are linked to all 17 SDGs. In fact, twelve SDGs depend directly on the sustainable use of resources, with resource efficiency being explicitly addressed in targets 8.4, 9.4, and 12.2.[4]

In a nutshell: RECP is a widely applied concept and a cost-effective and critical measure for achieving the goals set down in the SDGs and the Paris Agreement. It addresses economic, environmental and social benefits – individually and synergistically.

WHAT'S IN IT FOR SMES?

There is strong evidence that increasing resource efficiency can yield higher economic growth and employment, promote innovation and improve the competitiveness of countries and companies.[5] In economies worldwide, SMEs contribute greatly to production, exports and employment, so they usually play a pivotal role in the industrial economy of a country. However, SMEs also must struggle hard to keep their costs down and to remain competitive.

Industries and companies both large and small are currently facing even more challenges: growing environmental awareness in global value chains, of investors, governments and customers are putting pressure on them to function in an environmentally friendly manner.

Yet, SMEs often lack knowledge about more efficient and cleaner production processes and about the technologies that are associated with RECP. This in turn results in the excessive usage of resources such as energy, water and materials – and the SMEs' costs soar. However, it is a dilemma, because SMEs must become more productive in order to be able to invest in resource efficiency, and they need solidly anchored management processes to maintain their efficiency measures.

RECP can help companies (including SMEs) to overcome these cost and competition hurdles and to venture on to a new path to competitiveness and financial success, thereby not only protecting jobs but also creating new ones.[6] Having said that, the success of every RECP programme depends on the expectance of clear benefits for and by SMEs. These benefits

4,5 UNEP (2017) Resource Efficiency: potential and Economic Implications, IRP, Ekins, P. and Hughes. M. et al.

6 An analysis of the relationship of RECP to job creation was performed by Pfeiffer and Rennings in 1998 (Source: Employment Impacts of Cleaner Production, Friedhelm Pfeiffer, Klaus Rennings, Zentrum für Europäische Wirtschaftsforschung (ZEW), January 1999). The authors found that in many companies RECP leads to a net creation of jobs rather than end-of-pipe technologies. Like other innovations, however, eco-innovations tend to require higher personnel qualifications, so the demand for skilled and highly-skilled labour rises, while the demand for unskilled labour falls. These results imply that supporting cleaner production does not conflict with labour market policy – but synergies were found to be minimal and very specific. ILO finds that the effects of climate change will alter the structure of employment; new jobs and new job families will emerge, while others will disappear or even become unsustainable. As a result, enterprises must find ways to organise work and production differently (source: https://www.ilo.org/global/topics/dw4sd/themes/green-jobs/lang-en/index.htm).

must be clearly communicated at the outset of a programme – while not all arguments fit in each context, you can use the following list as guidance in your communication:

- Increased efficiency and productivity, plus improved competitiveness of companies
- Reduction of material storage
- Reduction of working capital and increased ROI
- Reduced dependency on scarce materials, fossil fuels, water
- Creation of new market opportunities for companies
- A starting point for the continuous improvement of environmental performance and for the promotion of the best available technologies and innovative approaches
- Improved working conditions for employees by reducing the use of hazardous substances, reducing noise and heat losses to the environment, promoting cleanliness and supporting the organisation of work, education and training
- Improved management thanks to the provision of better information on materials, energy flows and inefficiencies:
  - RECP provides tools to track materials and energy flow, making management more cost-aware.
  - It provides tools to understand, measure and reduce the sources that are generating waste.
  - RECP helps companies to meet better environmental standards and legal requirements and reduces the risks for violating environmental standards.
  - It supports the definition of responsibilities, the control of procedures, helps to raise awareness and encourages training.

At the same time, **you should be aware of potential obstacles** for introducing and implementing RECP instruments measures with SMEs. It is important to analyse the exact obstacles in every context and to find answers to them. The list of hints and recommendations (part 3) will help you in doing so.

Obstacles may include:

- Cheap water and/or energy reduce the incentive to perform RECP analyses and/or implement measures
- Limited awareness of RECP options and new technologies among SMEs
- Lack of affordable sources of capital (e. g. low-cost/long-term finance) for implementing RECP measures and necessary investments
- Policy or financial instruments for reducing risks/ transaction costs are not readily available
- Or: Limited knowledge of the government support that is available for RECP
- The scale of individual RECP activities for SMEs is too small to achieve any reasonable returns
- Lack of time for analysis or the active development of improvement options
- General management capacities that are necessary for implementing environmental management practices are limited

EVOLUTION OF APPROACHES TO PROMOTE RECP

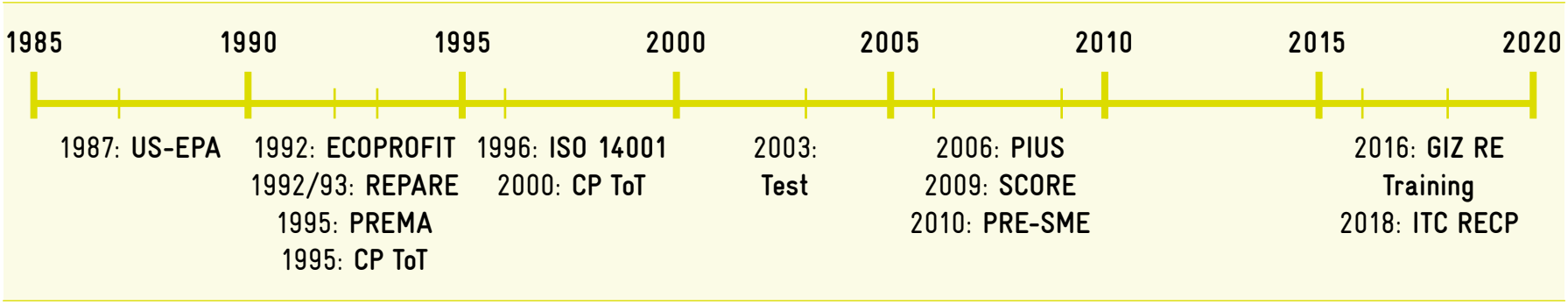


FIGURE 1: Timeline showing when different RECP instruments were created

EVOLUTION OF APPROACHES TO PROMOTE RECP

The idea of preventive environmental protection – also known as cleaner production (CP) – can be regarded as the **first generation** of resource efficiency. The concept emerged in the 1980s in industrialised countries. CP was first focused on material efficiency, reducing the use of hazardous materials and minimising the generation of hazardous work. Over time, these instrument goals evolved into energy efficiency, health and safety, procurement and legal compliance. CP was mainly implemented through individualised consulting using instruments such as flow sheets, input/output analyses and material flow analyses.

In the **second generation** of instruments from 1992 on, group-based consulting and self-assessments were used as methods to encourage the involvement of more companies and to challenge internal knowledge. Instruments introduced managerial and motivational elements like teamwork, communication, motivation, monitoring and controlling. The experience of many RECP centres has shown that focused organisational/managerial and technical support, the combination of self-assessment and external expertise, teaching company representatives how to support the formulation of strong action plans and actual implementations are all additional and relevant motivating factors for SMEs.

UNIDO started promoting the concept of cleaner production at the Rio Conference in 1992. The first UNIDO programmes were carried out in the Czech and Slovak Republics, quickly followed by the establishment of the *National Cleaner Production Centre* (NCPC) *Programme* in emerging and developing countries (47 countries in all, including Nicaragua, Colombia, Brazil, Uganda, Kenya, India, China and South Africa)[7]. In 2010, UNIDO and UNEP founded the *Global Network for Resource-Efficient and Cleaner Production* (RECPnet). Also supported by SECO (the Swiss State Secretariat for Economic Affairs), its aim was to bring together leading RECP service providers at global and regional levels to catalyse the effective and widespread application of RECP in developing and transition economies.

At its peak in 2015, the network had over 70 members covering 60 countries around the world. RECPnet members contributed to the effective and efficient development, application, adaptation, scaling up and mainstreaming of RECP concepts,

7 Source: https://www.unido.org/our-focus/cross-cutting-services/partnerships-prosperity/networks-centres-forums-and-platforms/national-cleaner-production-centres-ncpcs-networks

methods, policies, practices and technologies in industry. The RECPnet Knowledge Management System (KMS) consisted of an e-library and web-based communication services. The material was only accessible for RECPnet members and consisted of toolkits, training documents, manuals, guidelines, case studies, factsheets, success stories, events, indicators, benchmarks, research papers, expert profiles and training courses.

RECPnet funding ended in 2018 and the network has not been actively managed since then. However, the RECP service providers – and especially the NCPCs that were part of the RECPnet – are still active.[8] An overview of the members can be found here.

Since this time, RECP is on the agendas of governments and businesses and there have also been successful initiatives to include CP in national legislation (e. g. China, Moldova, Georgia).[9]

Experience during the past decades of applying RECP instruments has demonstrated that activities and impacts can – and should – be scaled through intervention models such as:

- Group-based coaching of SMEs to implement RECP through self-assessment
- Cooperation in industrial parks
- Sector-based benchmarking
- Value chain coordination and alignment.

Elements of some of these approaches are used in the instruments studied in this report, including value chains in SCORE and the ITC RECP instrument, group-based approaches and self-assessment carried out to various extents in PREMA, ECOPROFIT and SCORE, plus industrial parks in the SIA Toolbox and benchmarking in the ITC RECP instrument.

8 Source: https://www.recpnet.org/wp-content/uploads/2016/08/NCPC-20-yrs-final.pdf

9 Cleaner Production Promotion Law in 2002: Institutionalising cleaner production in China: the Cleaner Production Promotion Law, January 2005International Journal of Environment and Sustainable Development 4, DOI: 10.1504/IJESD.2005.007739 SourceOAI; Moldau: http://extwprlegs1.fao.org/docs/pdf/mol159048.pdf; Georgia: http://extwprlegs1.fao.org/docs/pdf/geo180258.pdf

2

INSTRUMENTS AND TOOLS FOR STRENGTHENING RECP IN COMPANIES

2 Instruments and Tools for strengthening RECP in companies

This part introduces six selected RECP instruments as well as further supporting tools for strengthening RECP in companies. First, each instrument / tool is described in detail. Afterwards, we highlight similarities and differences and the potential results to be achieved with each instrument are described. A table then summarises the main characteristics of each instrument / tool.

We are using a typology of two types of instruments (see figure 2):[10]

1. **Instruments:** An instrument is a targeted sequence of activities aimed at introducing RECP practices in a company and implementing RECP measures. Instruments usually include a detailed curriculum and training materials, guidelines for implementation as well as methods for identifying RECP measures in the companies.
2. **Supporting Tools:** Supporting tools provide selected technical contents that can be a useful addition to a programme - offering benchmarks, checklists and collections of case studies.

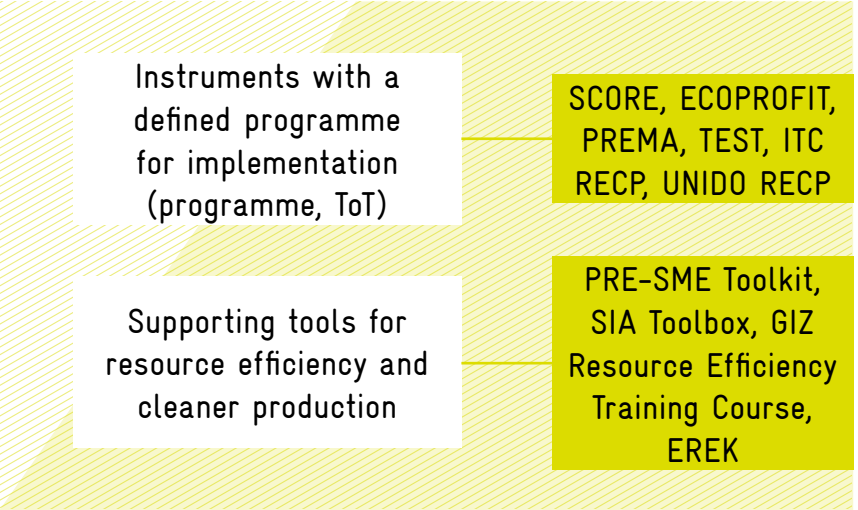


FIGURE 2: Types of instruments and tools

10 Note: The information collected during the interviews and the publications consulted show that adjustments were done over time in the PREMA, ECOPROFIT, RECP, and TEST programmes and these altered the original design of the instrument. The description of the instruments does focus on the original programme design but includes examples of alterations.

OVERVIEW OF RECP INSTRUMENTS AND TOOLS

The six RECP instruments described below are designed to initiate a process of continuous improvement of the environmental performance of companies (mainly SMEs), by using a combination of the following steps:

- Preparation (definition of objectives, involvement of stakeholders & peers, marketing of the programme)
- Team building, improvement of the company's internal cooperation and its cooperation with other companies (e. g. networking events), improvement of internal and external communication
- Worksheets and checklists for (self-)assessment
- Technical workshops
- Individual consulting (needs-based; solution-oriented; including feasibility and financing)
- Preparation of best practice examples for the future acquisition of new companies/organisations

The differences between the instruments mostly concern the **key interventions**, **target group and industries**, **programme duration and costs**. Table 1 provides an overview of all **instruments and supporting tools** covered in this navigator with regards to these factors.

TABLE 1: Overview of RECP Instruments and Tools

Instruments →

INSTRUMENT	KEY INTERVENTION	TARGET GROUP / INDUSTRIES	PROGRAMME DURATION	INSTRUMENT COSTS
SCORE (ILO) →	Improving productivity, working conditions and management practices. Includes 5 modules, of which one module on "Productivity through cleaner production". Combines practical classroom training with in-factory consulting. Systematic pre-assessment of the companies, which promotes an in-depth and needs-based support of companies	Micro-enterprises and SMEs All industries	3 months per module (1–2 days for baseline assessment, 2 days classroom training, 3 days of consulting (per company) with a potential total of 5 modules (max. 15 months) Potentially more time for support of implementation in companies	€ 2,000–€ 10,000 per company
TEST →	Combination of a detailed RECP assessment as foundation of an ongoing information system, introduction of environmental and energy management systems and material flow cost accounting.	Companies which have a relevant material, energy or water flow, both SMEs and larger companies Service provider All industries	3 years, including awareness-raising, involvement of companies and the implementation of the identified options.	More than € 10,000 per company

INSTRUMENT	KEY INTERVENTION	TARGET GROUP / INDUSTRIES	PROGRAMME DURATION	INSTRUMENT COSTS
ITC RECP →	Increasing the competitiveness of SMEs in international value chains through the reduced consumption of resources used in production processes, enhanced productivity and legal compliance, involving key clients, international buyers and financing institutions Development of national benchmarks Self-assessments, Personalized face to face coaching sessions, Technical group trainings based on needs assessment, online trainings	SMEs in international value chains So far, the instrument has been implemented in the clothing, tea and coffee sectors but may be applied to other sectors	4–6 months for the coaching programme and 6 months for implementing the resource efficiency options (including support for the financing of investments)	€ 2,000-€ 10,000 per company
ECOPROFIT →	Implementation of RECP with a regional focus, using elements of experience-based learning in group-settings in order to identify technical and organisational measures to improve resource efficiency. Participants receive ECOPROFIT award after successful completion	SMEs Service providers All industries A condensed version also targets micro-enterprises and the hospitality industry	Basic Programme: 3–5 days of individual consulting over a period of 10 months RECP Club Programme: 3 workshops annually, 3 working groups, company visits and an award upon successful completion.	Up to € 2,000 EUR per company

INSTRUMENT	KEY INTERVENTION	TARGET GROUP / INDUSTRIES	PROGRAMME DURATION	INSTRUMENT COSTS
PREMA →	Aims at four wins at company level: 1) Reduction of production costs and increase in productivity and competitiveness 2) Improved environmental and climate performance, increased resource efficiency 3) Strengthening of organisational capabilities and implementation of change 4) Efficient management of risks and selected social aspects. Group approach based on experiential learning and co-generation of results. The focus lies on reduction of „Non-Product Output" (NPO) and change management.	Micro-enterprises, SMEs, service providers as well as schools, economic clusters, supply chains and industrial areas All industries	Overall 4-6 months: 5 days basic training module (day 3 is an on-site-diagnostic in participating companies); Follow-up consultancy for each company on site 2-3 days; Participation in company network with 3 days of group counselling	€ 1.500 - € 5.000 per company
UNIDO RECP →	Capacity building for carrying out preliminary and full assessments at company level and supporting implementation of identified measures. Supporting activities are: › Technology transfer, visits, study tours › RECP awareness-raising › Policy advice to integrate the preventive principle into national legislation Operates through well-established National Cleaner Production Centres.	SMEs also useful for larger companies	ToT: Original training plan lasts 5 days, work with a company and final report takes 3 days. RECP Assessment: work with a company, usually spread over 3 to 5 months RECP Club (UNIDO model): workshops and consultancy usually spread over up to 6 months	More than €10,000 per company

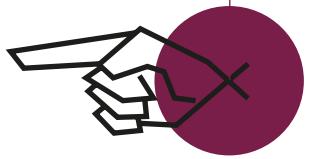
Supporting Tools →

TOOL	KEY INTERVENTION	TARGET GROUP / INDUSTRIES	PROGRAMME DURATION	TOOL COSTS
PRE-SME Toolkit →	Provides information on good housekeeping, benchmarking; worksheets available for continuous improvement.	SMEs, service providers All industries?	–	–
SIA Toolbox →	Toolbox offers almost 300 tools, case studies, reports and a range of opportunities to improve the environmental performance of individual companies and industrial sectors.	SMEs All industries	–	–
GIZ Resource Efficiency Training Course →	Training course with focus on the most relevant RECP methods and tools.	Focused on intermediaries	Three-day training course	–
EREK →	One of the main products of the EREK is the RECP self-assessment tool. Shows companies how to identify what causes inefficiency and losses and to generate options for improvement.	SMEs All industries?	–	–

2.1 RECP Instruments

Overwiew

- → SCORE
- → TEST
- → ITC RECP
- → ECOPROFIT
- → PREMA
- → UNIDO RECP



→ SCORE – Sustaining competitive and responsible enterprises

KEY INTERVENTION	Improving productivity, working conditions and management practices. Provision of support for the implementation of SCORE, which combines practical classroom training with in-factory consulting. One of 5 modules focuses on "Productivity through cleaner production".
TARGET GROUP / SECTOR	SMEs with 50–250 employees and micro-enterprises All industries Focus on changing manufacturing processes, working conditions, on reducing costs per unit and on end-line defects.
PROGRAMME DURATION	3 months per module (1–2 days for baseline assessment, 2 days classroom training, 3 days of consulting (per company)) with a potential total of 5 modules (max. 15 months) Potentially more time for support of implementation in companies

TABLE 2: Overview SCORE

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

SCORE is a global ILO instrument designed to improve productivity and working conditions in small and medium-sized enterprises (SMEs). The key intervention of this global programme is the provision of support for the implementation of SCORE training, which combines practical classroom training with in-factory consulting. SCORE training demonstrates best international practice in the manufacturing and service sectors, helping SMEs to actively participate in global supply chains.

SCORE has involved national partners in different ways. In Indonesia, Vietnam and Ghana, for example, capacity was built in the productivity centres of the respective Ministries of Labour. In China, SCORE built up the capacity of the OSH ministry (Occupational Safety & Health) to use SCORE training in their SME targeting, OSH enforcement and capacity-building efforts. In India, SCORE worked with the Ministry of SME to help them improve the quality of their Lean Manufacturing Competitiveness Programme.

The instrument is involving key clients with good results in China and India. SCORE succeeded in sourcing funding to pilot a supply chain capacity-building programme in China with the UK Ethical Trading Initiative. Companies in China continue to purchase SCORE training courses. SCORE is also trying to use this approach in Africa with 'Partner Africa', which carries out extensive auditing of suppliers and can possibly sell SCORE training to its customers.

The initial plan was that SGS[11] and TÜV Rheinland[12] would market and sell SCORE training courses to their existing customer bases, which are mostly derived from supplier audits. According to our interview partner, however, this was not very effective, since both SGS and TÜV Rheinland have competing offerings that are branded under their training academies – and the target group, the SMEs, is not a profitable market for them. SCORE operates through a central team located in Geneva, Switzerland, with colleagues based in eight core programme countries in the national ILO offices. The key activities of the national technical adviser are shown in Figure 3.

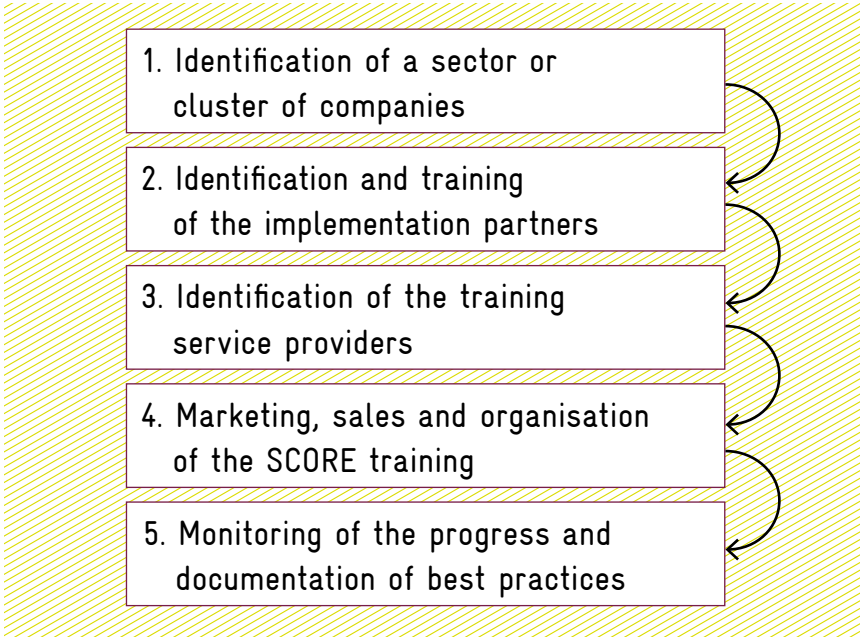


FIGURE 3: Activities for the implementation of SCORE

11 SGS provides testing, verification, physical testing and certification services.
12 TÜV Rheinland AG is an internationally active, independent testing service provider

PROCESS

The training programme is created and run by national consultants, who are chosen for their individual specialities that match the module in question. The training for each module begins with a two-day workshop hosted by a national consultant. Four to five companies are trained together, and each company is usually represented by two managers and two staff workers. After the workshop has finished, the national consultants visit the companies to give advice and support while the knowledge that has been learnt is put into practice. The SCORE training process is aimed at addressing

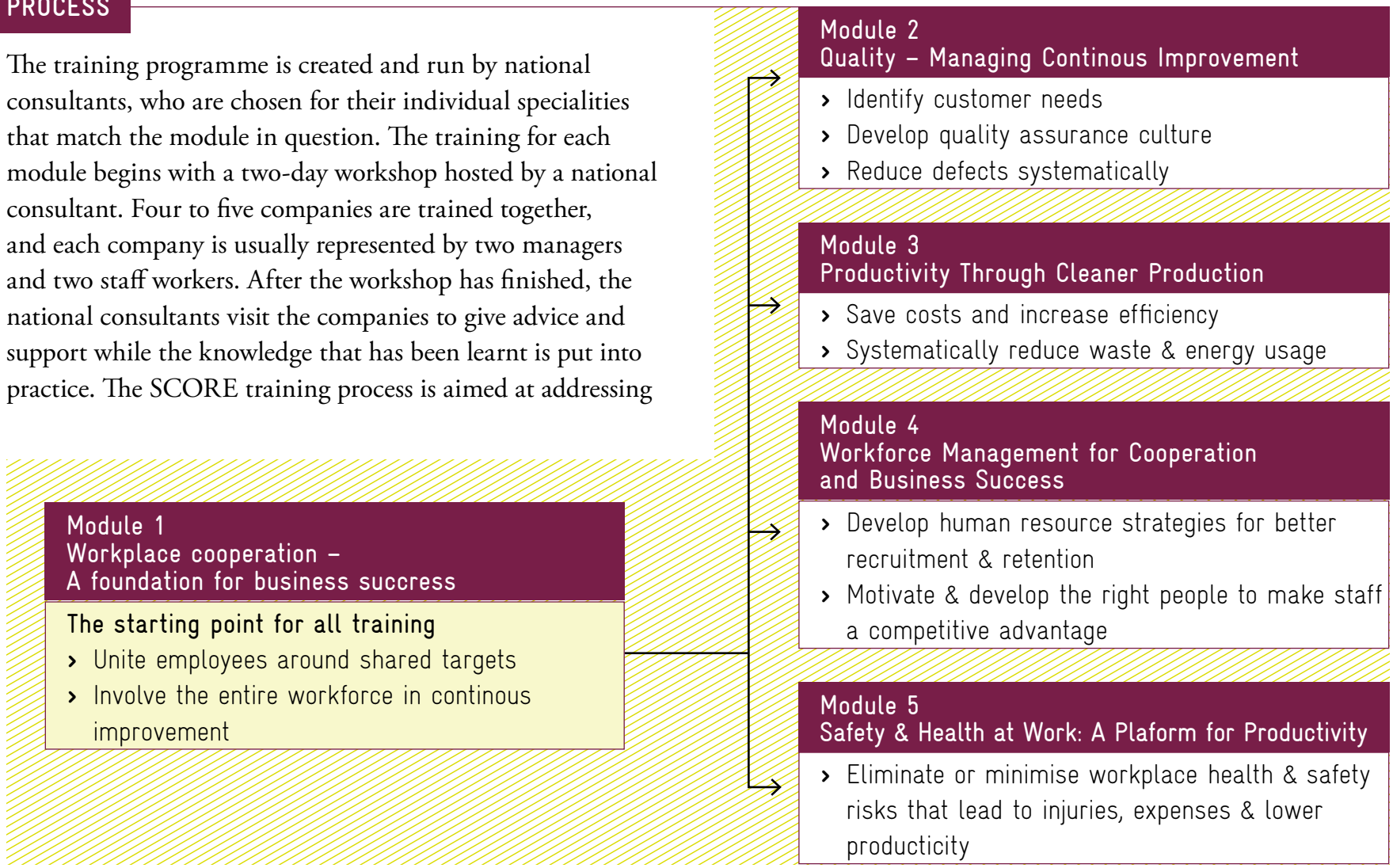


FIGURE 4: SCORE Training Modules[13]

13 Source: Impact of ILO SCORE Training on management practices, working conditions and business results in Peruvian SMEs, ILO 2020

the individual needs of each company. It demonstrates lean manufacturing techniques that have been proven to increase production efficiency and offers 'value for money' training. The costs for the training course can be recovered quickly, usually within one month.

All companies start their SCORE training with module 1 which is entitled, 'Workplace Cooperation – a Foundation for Business Success.' More modules are then selected based upon priorities selected during the baseline assessment.

The 'technical assistance and support' that kicks off in element 3 of the SCORE modules includes the identification of options by an external expert, assistance by measurement procedures, the calculation of losses, the facilitation of internal team meetings, technical expert advice, links to suppliers, feasibility analyses and the provision of access to external funding.

According to our interview partners in Peru and the evaluation reports on the three phases there, many of the participating companies attend module 1 only, because the Peruvian government finances their participation in it. No financial support is available in Peru for the other modules.

During the last project period in Peru, 52 companies participated in the programme and implemented 491 improvement projects.

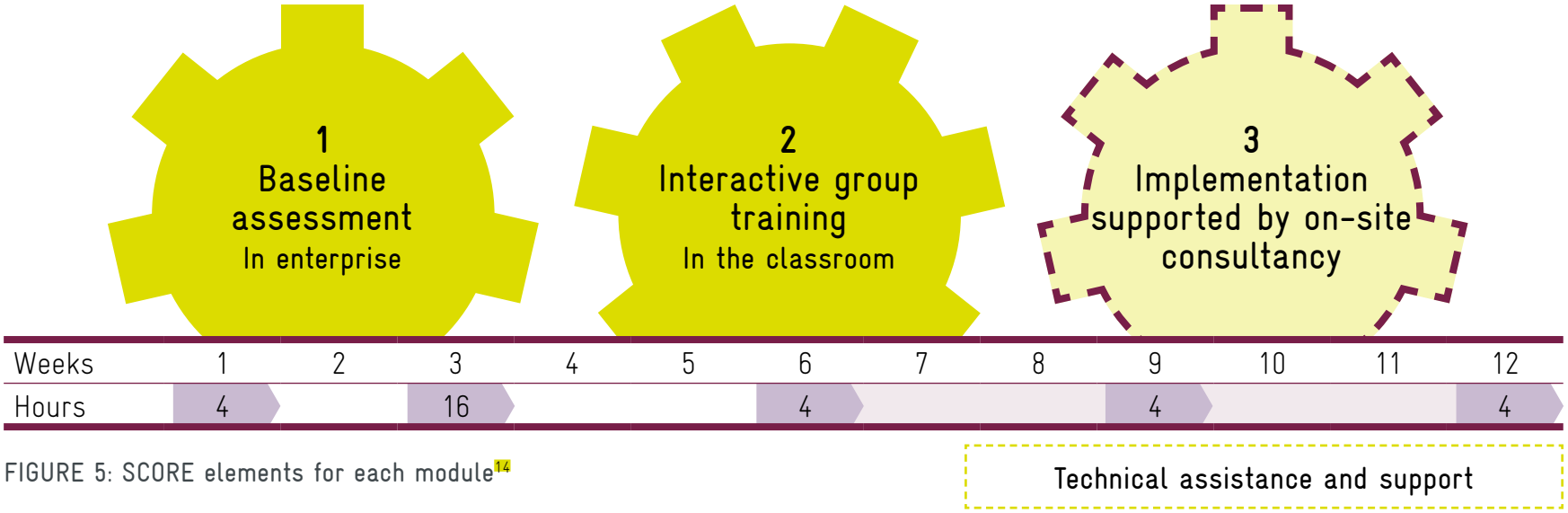


FIGURE 5: SCORE elements for each module[14]

14 Source: http://www.ilo.ch/empent/Projects/score/WCMS_321117/lang--en/index.htm

The average number of RECP projects implemented per company varies between four and five depending on the module; however, the average number of RECP projects implemented as a direct result of module 3 is only two or three.

The areas covered by SCORE are shown in Figure 6 (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage).[15]

Many of the participants attend module 1. It focuses on teamwork and lean management, which in turn target cooperation, workplace optimisation, the maintenance and optimum use of materials and energy and equipment in the workplace. A targeted improvement of resource efficiency through the systematic optimisation of material and energy flows and/or circular production can only be achieved if the companies participate in module 3 – 'Productivity through cleaner production'.

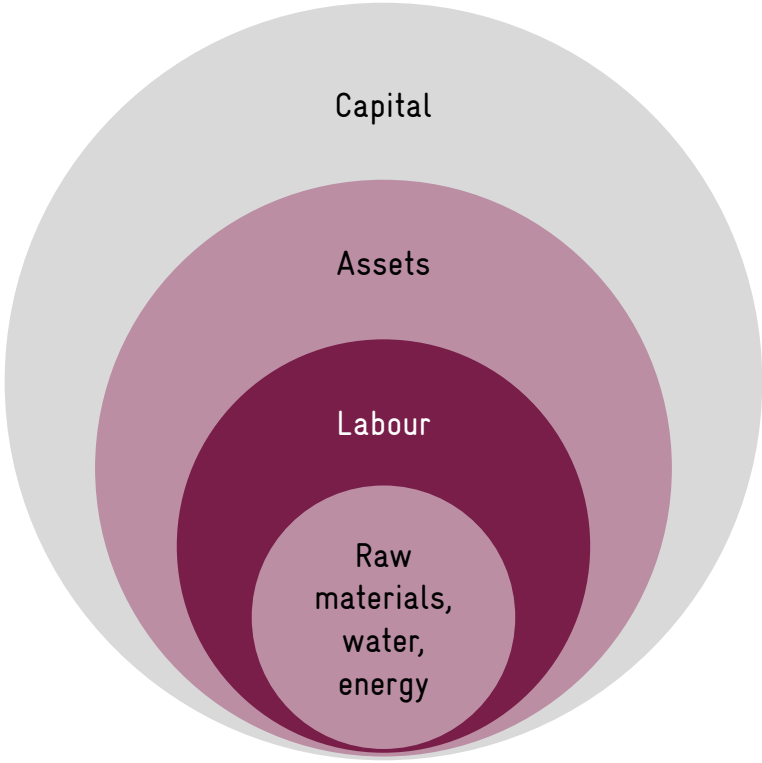


FIGURE 6: Onion skin chart for SCORE

15 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources (addressed, especially if companies participate in module 3).

TARGET GROUP

- SMEs with 50–250 employees and micro-enterprises
- All industries
- Additional modules for the construction sector, gender equality, tourism and service providers have also been developed.

The instrument can be implemented in SMEs (according to the programme description on the ILO website) and in micro-enterprises (according to the interviewees).

The instrument focuses on changing manufacturing processes, working conditions, on reducing costs per unit and on end-line defects, etc. Methods used are e. g 5S[16] , lean management and Kaizen.

For example, in Peru, 46 out of 52 participating companies believed that labour productivity had increased in the past two years – and 93 % of these stated that SCORE training had positively influenced this outcome. Customer satisfaction with product quality improved in nearly all the companies and 88 % of these declared that SCORE had had a positive impact on this result. Sales and profits increased in 35 companies – and 63 % of these stated that SCORE training had positively influenced their financial results.

16 5S is a method to optimise the workplace. The five "S" stand for: "sort", "set in order", "shine", "standardise" and "sustain".

COUNTRIES OF IMPLEMENTATION

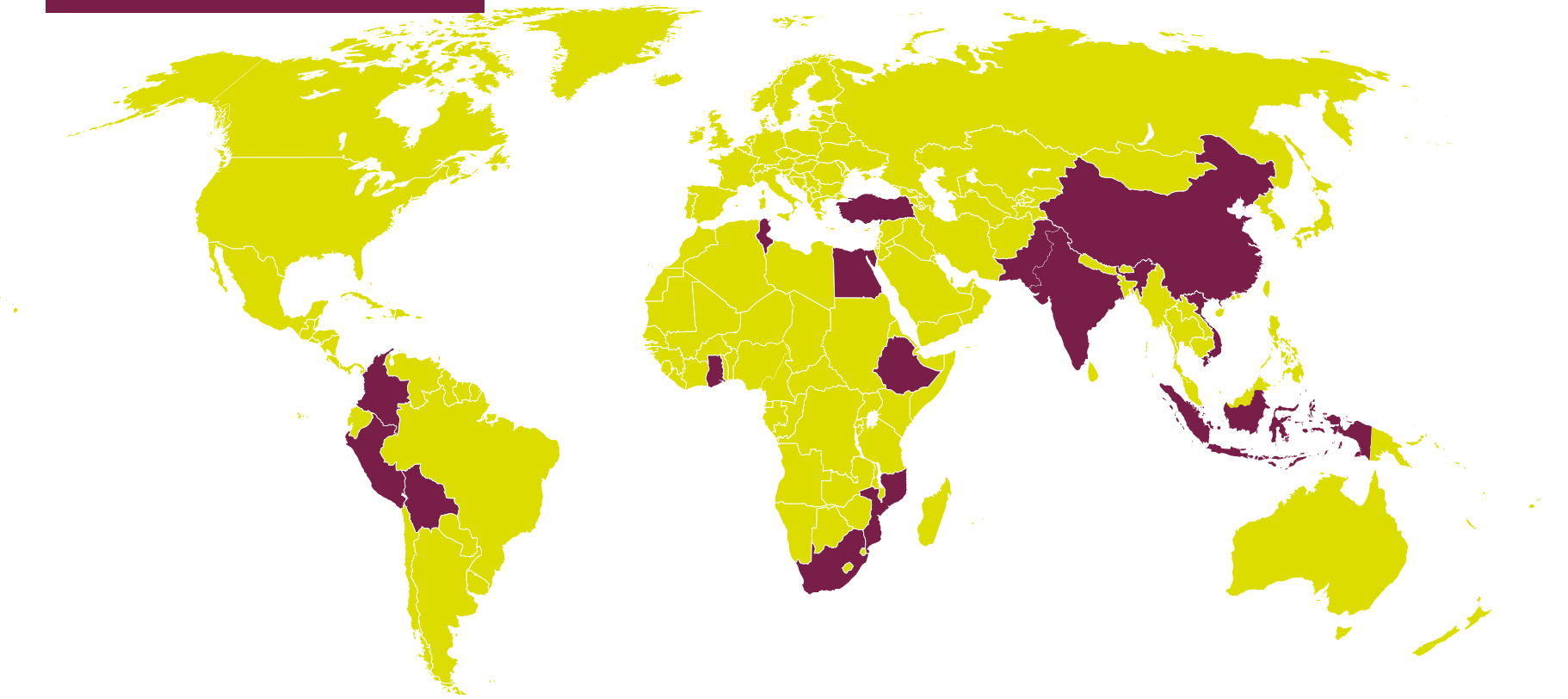


FIGURE 7: Countries in which SCORE projects have been implemented

The instrument was launched in China and Indonesia in 2009. It is currently carried out in Bolivia, China, Colombia, Ethiopia, Egypt, Ghana, India, Indonesia, Myanmar, Pakistan, Peru, South Africa, Tunisia, Turkey, Vietnam and Zimbabwe. Around 1.700 companies have been involved in the programme for the past 11 years.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

No specific requirements exist for the companies involved. Experienced consultants are recruited nationally. Training programmes for consultants were held in several countries. The consultants are recruited based on a skill profile (7-10 years factory experience, industrial engineering, lean manufacturing). SCORE tends to use its Employer and Business Membership Organisation (EBMO) networks as a launchpad in each country. However, to provide qualified trainers, the instrument has also appealed to relevant sources, used various methods to awaken interest and reached out to organisations like SGS and TÜV-Rheinland. The ILO also cooperates with the National Cleaner Production Centres (NCPC) of UNIDO and makes use of the skills of their experts.

The ToT (Training of Trainers) encompasses:

- 2 days of classroom training on SCORE training methodology for classroom workshops.
- Visits to companies (baseline and follow-up visits) facilitated by a SCORE expert trainer.
- 1 baseline visit facilitated by a SCORE expert trainer. Trainer teams observe and complete the baseline assessment form.
- 2 days of a module workshop with companies, facilitated by a SCORE expert trainer.
- Trainers observe and co-facilitate at least one session of a module workshop.
- Trainers work with the companies assigned to them during the workshop.
- 1 company visit facilitated by a SCORE expert trainer. A trainer team observes and assists.

DURATION AND COSTS OF THE PROGRAMME

- 3 months per module (1–2 days for baseline assessment, 2 days classroom training,
- 3 days of consulting (per company) with a potential total of 5 modules
- The programme uses national consultants

- **Cost of the training** provided for companies per module: two trainers each, 2.5 days training in the classroom, 4 days preparation for the training.
- **Cost for company visits per company:** 0.5 for pre-assessment, 3 days individual consulting

- **Cost of participation:** e. g. in Peru, USD 2,000.- per module (includes the training and the individual on-site consulting)
- **Additional costs:**
  - Training of national trainers (ToT)
  - Reporting: one day estimated per company
  - Travel costs depending on the location of the companies
- **Donors:**
  - The State Secretariat for Economic Affairs (SECO)
  - The Norwegian Agency for Development Cooperation (NORAD)
  - The Canadian Labour Programme (Labour Program)
  - National Government Agencies (this from experiences gained in Peru)
  - Implementation partners: TÜV Rheinland (provided qualified trainers for ToT), Ethical Trading Initiative, SGS (provided qualified trainers for ToT), lead buyers (e. g. Inditex)

SAVINGS

Percentage of participants who reported improvement in the categories are shown in Figure 8. Details on the actual amounts saved in physical units or in monetary savings were not collected. The results are collected by means of a survey and the numbers are based on the survey answers given by the participating company.

EXAMPLES

Many examples and best practices are published on the website of the International Labour Organisation are. One company example on the next page.

SCORE TRAINING RESULTS

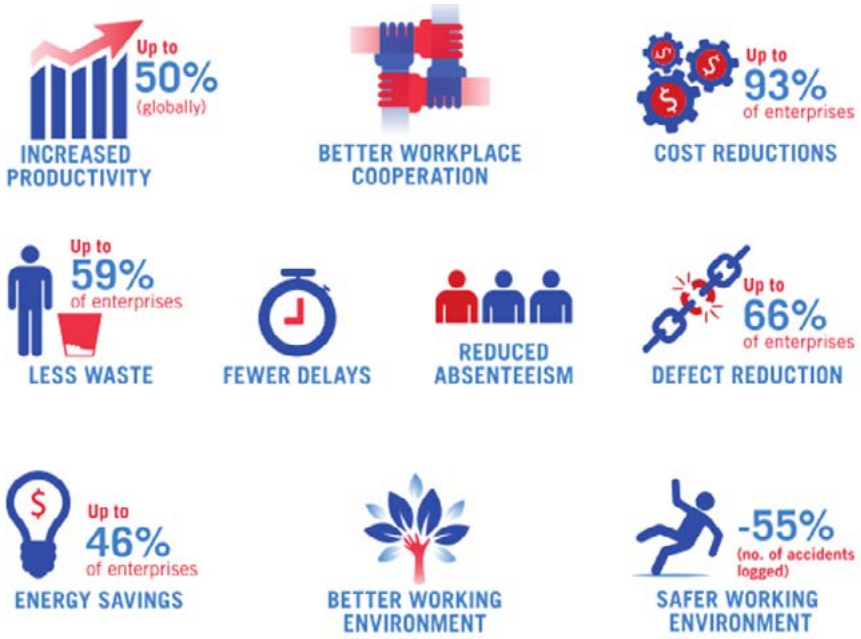


FIGURE 8: Results reported for the first and second SCORE project phases[17]

17 Source: Improving productivity and working conditions, supporting small and medium-sized enterprises to grow and create better jobs, SCORE Global Programme, Michael Elkin, Chief technical advisor

COMPANY EXAMPLE

SME name: **CIMMSA Corporation S.A**
Location: **Ate District, Lima, Peru**
Staff: **24 workers (4 woman)**
Established: **2011**
Product: **Refrigeration equipment**



„SCORE is driving change through increased motivation. SCORE Training has been a very good starting point, we were shown weaknesses in the company and put on track to achieve our goals." – Villacriz Fernández Gilberto, General Manager

SCORE Training in pictures



left: Before SCORE Training – Disordered and unclean cooling area
right: After SCORE Training – More ordered cooling area with specific space for finished products



lef: Before SCORE Training – There was no designated area for finished products
right: After SCORE Training – Finished goods test area with signage and clearly marked walkways

KEY RESULTS: INCREASED QUALITY & REDUCED COSTS

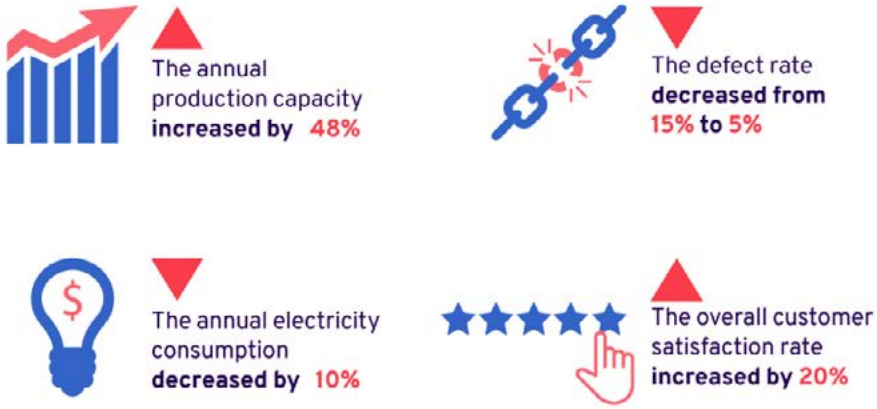


FIGURE 9: Key results of SCORE case study Peru[18]

→ MORE LINKS

18 wcms_758068.pdf (ilo.org)

SUMMARY OF THE SCORE INSTRUMENT

✓ STRENGTHS	– WEAKNESSES
The global SCORE programme is supported by commerce chambers, employees' organisations, national programmes, industry clusters, governments and trade unions. The scope of this support depends on how much each country wishes to get involved, but the support itself makes it easier to get companies involved in the programme.	From a company perspective, the costs for the modules are high, and therefore most of the companies only participate in module 1 (In the case of Peru simply because it is partly financed by the Peruvian government).
Management practices and working conditions are improved, enhancing the overall company performance.	In Peru, module 1 is mandatory, but only very few companies participate in module 3 after attending module 1.
SCORE either focuses on sectors or geographic areas, because they have similar problems.	Marketing needs more activities to involve companies in the RECP module after Module 1's 'workforce cooperation'.
The programme generates solidly structured results which are efficiently published – and from a company perspective, the improvement of the working conditions is linked to the improvement in productivity.	The published results show the percentage of achievement, but neither the quantities of physical units (e.g. m^3 water, kWh electricity, etc.) nor the monetary savings achieved.
Individual consulting is performed by expertly trained local consultants.	The training programme needs to be more strongly linked to existing public policies and the national resource efficiency indicators.
	The baseline is not often clearly defined, there is a clear lack of indicators and of long-term monitoring of the achievements.

TABLE 3: Summary of the strengths and weaknesses of SCORE

→ TEST – Transfer of environmentally sound technology

KEY INTERVENTION	Identifying and exploring the most feasible ways of achieving resource efficiency. Combination of a very detailed RECP assessment, environmental and energy management systems and material flow cost accounting. Definition of a baseline and implementation of an information system for continuous improvement of the environmental performance.
TARGET GROUP / SECTOR	Companies which have a relevant material, energy or water flow → applies to both SMEs and larger companies; As well as Service Provider; Focus on optimisation of processes at company level Application to every industrial sector
PROGRAMME DURATION	3 years, including awareness-raising, involvement of companies and the implementation of the identified options.

TABLE 4: Overview TEST

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

The TEST approach is a systematic way of identifying and exploring the most feasible ways of achieving resource efficiency and the continuous improvement of the use of materials, water and energy within a company, while building on the company's specific needs and internal capacities.

It combines elements of a set of tools for sustainable production, namely Resource-Efficient and Cleaner Production Assessment (RECPA), Material Flow Cost Accounting (MFCA) and Environmental and Energy Management Systems (EMS/EnMS) within the framework of the learning cycle (Plan, Do, Check, Act). Thanks to the customised integration and implementation of these tools and their elements, best practices, new skills and a new management culture are adopted, enabling the company to move efficiently towards more sustainable production business models.

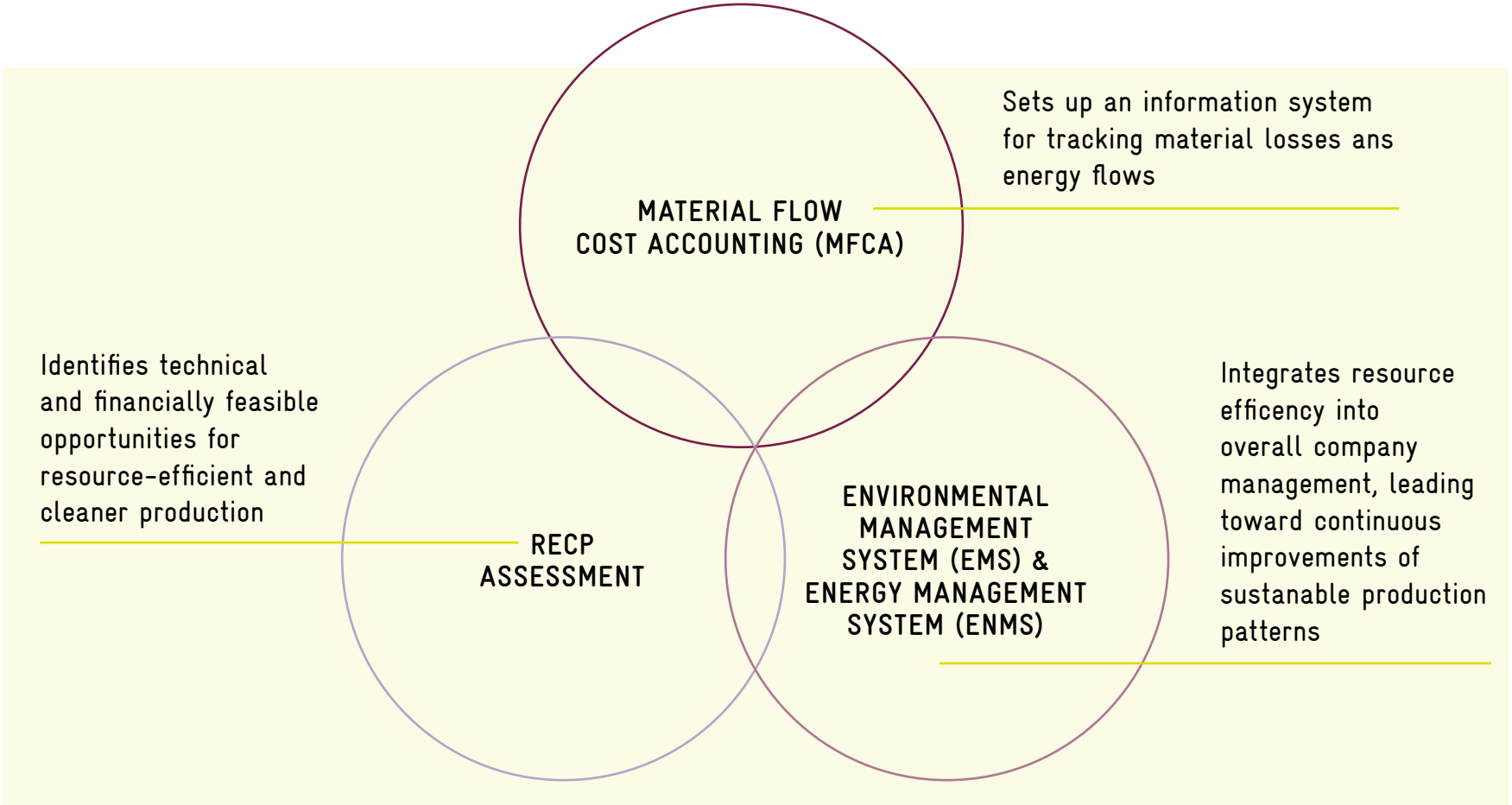


FIGURE 10: Tools used in the TEST instrument[19]

The instrument was developed within the framework of the DANUBE programme 2003 and continuously developed within the context of the EU SWITCHMed programme.[20]

The heart of the TEST approach is the Resource-Efficient and Cleaner Production Assessment (RECPA) tool, which is a step-by-step assessment of financially feasible options for improving

19 Source: https://www.test-toolkit.eu/wp-content/uploads/2019/09/TEST_GUIDELINES_EN.pdf
20 MED TEST I (2009-2012): MedPartnership in 3 countries, 43 companies; MED TEST II (2014-2018): SwitchMed in 8 countries, 125 companies

the resource efficiency and environmental performance improvements of production systems. The main output of this tool is a portfolio of financially feasible solutions, which include good housekeeping, operational control improvement, process and product modifications and eco-innovative technologies.

By providing relevant information, MFCA achieves the following:

- It makes all environment-related costs and benefits visible.
- It helps to raise environmental awareness in the 'core' of a company's business, by providing data to formulate targets and programmes for integrated environmental prevention, and by giving line managers and project managers an additional perspective for the decisions they make on environmental impacts, costs and benefits.
- MFCA tells the 'environmental story' of costs by providing data and information for the annual report (e. g. non-financial information in the director's report).
- It enables the communication of the progressive shift from emissions control and integrated prevention processes to integrated prevention products.
- It provides arguments as to why RECP pays; MFCA provides the information needed to convince financial departments to invest in RECP technologies and in human resources for environmental management.
- It can help management to identify environmental risks and to adopt measures that reduce such risks and the associated costs (e. g., insurance).

Core elements of the Environmental Management System (EMS) and the Energy Management System (EnMS) are used in TEST to integrate resource efficiency into a company's overall management systems. This provides operating criteria and internal resources, which in turn ensure that the results of improvement programmes are implemented, sustained and further developed. The EMS and the EnMS are designed in synergy with the implementation of RECPA, and MFCA tools have a solid foundation that is ideal for guiding companies toward continuous improvements in their production patterns. The areas addressed by TEST are shown in Figure 11. (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage).[21] Some countries provide funds for participating companies to implement measuring equipment. This approach provides assistance for the financing of new technologies. The implementation of a communication system to ensure long-term monitoring is also part of the project activities.

21 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources.

PROCESS

In a company, the instrument has four stages:

1. Pre-assessment: this stage checks whether the instrument is suitable for the company in question – the commitment of management is also encouraged and solidified (several months).
2. Assessment: Prepared by a series of in-company training courses, data is collected to describe the NPO. Measurements are either performed by the national consultants or bought by the implementing organization. Priorities are then defined based on the results. Sector experts develop options for priority areas (international). Agreement is then reached with the companies, as to which ones will be selected for implementation (9 to 12 months).
3. Implementation: The instrument provides implementation guidance for 6 more months – including 'match-making' with relevant national funds.
4. Monitoring: the national companies monitor the achieved results from the ongoing measurements or from additionally acquired data.

The instrument works with national and international experts and trainers. If national experts for specific sectors are not available, international experts support the national implementation team. The instrument is funded within the SWITCHMed programme of the European Union.

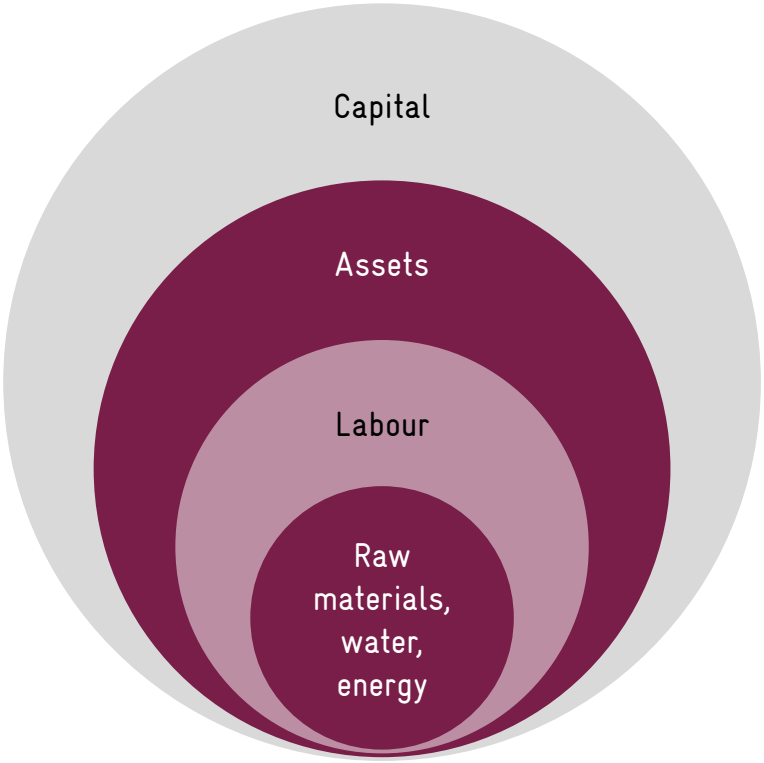


FIGURE 11: Onion skin chart for TEST

Estimated total programme costs per participating company are more than € 100,000 (including costs for the national implementation team, international experts, the development of the training materials, travel costs, materials for awareness-raising events, plus the organisation and realisation of workshops and network events).

The TEST kit consists of:

- A guideline document
- A set of tools (MFCA Excel file and manual, energy mapping tool, checklists, etc.)
- A set of training materials (ppt, exercises, case studies)
- Best Practice catalogues: more than 250 best practice examples from the MED region, 5 sectors

TARGET GROUP

The instrument applies to companies which have a relevant material, energy or water flow. This can apply to SMEs as well as to larger companies. The TEST tool kit targets company staff and service providers.

The instrument focuses on optimisation of processes at company level. Processes outside the company (CE aspects) are not explicitly addressed, but can be considered depending on the company's requirements, e. g. recycling of product components at the end of the product life cycle and reuse in the new product. The methodology can be applied to every industrial sector. International experts who match the company's requirements are selected. They then assess and identify sector-specific options for improvement.

The instrument has been implemented in the following sectors:

- Chemical and Pharmaceutical (23 companies)
- Food and Beverage (147 companies)
- Leather (13 companies)
- Metal, Electrical and Motor Vehicle Parts (19 companies)
- Paper, Printing and Plastic Products (11 companies)
- Textile and Garments (18 companies)

COUNTRIES OF IMPLEMENTATION

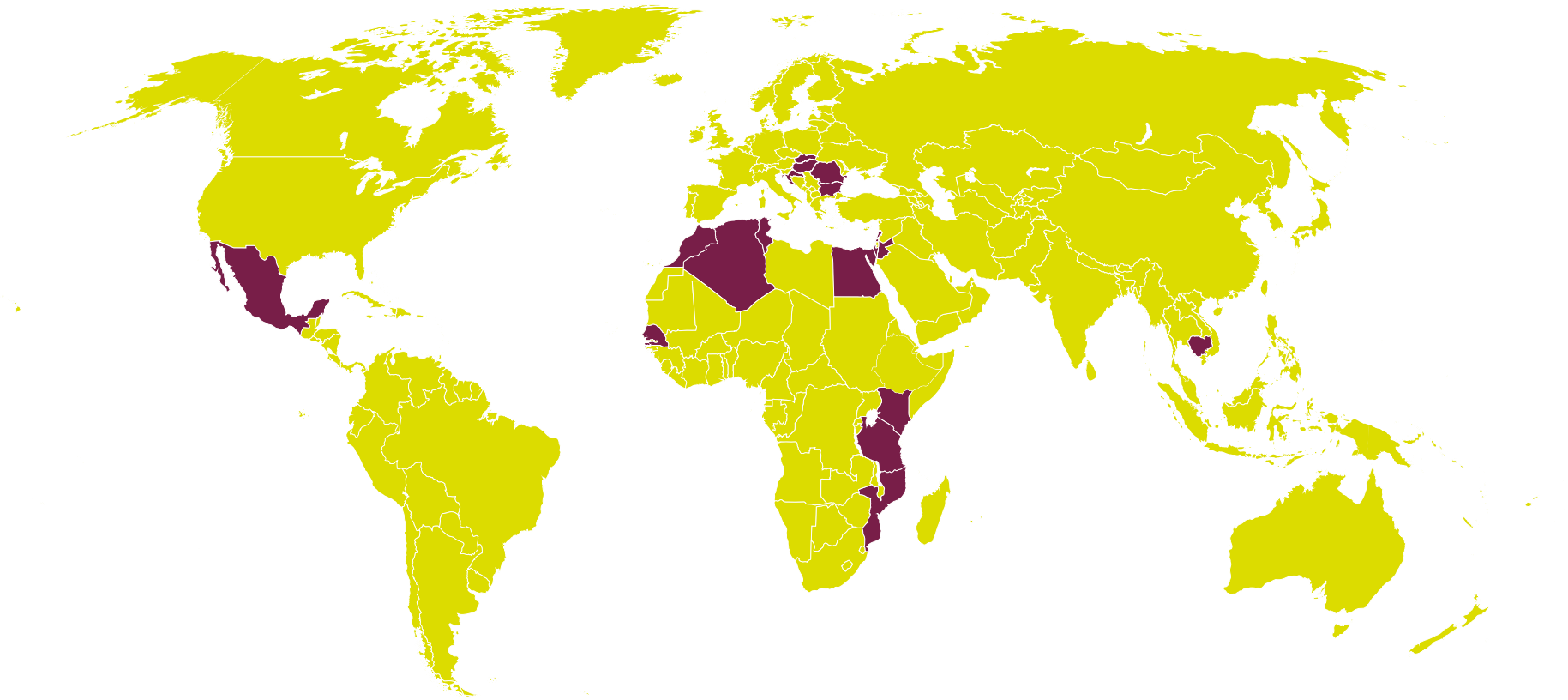


FIGURE 12: Countries in which TEST projects have been implemented

The instrument was implemented in the following countries: Algeria, Bulgaria, Cambodia, Croatia, Egypt, Hungary, Israel, Jordan, Kenya, Lebanon, Mexico, Morocco, Mozambique, Romania, Senegal, Slovak Republic, Tanzania and Tunisia.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

The instrument is used in companies which have a relevant materials, energy or water flow. A company's internal team must fully apply itself to the task of implementation if it is to succeed. The team acts as a resource pool that drives the process and interfaces with external consultants and service providers to integrate resource efficiency into processes and operations. An existing accounting system (which is in use and which reflects the real costs) is required to implement material flow cost accounting.

DURATION AND COSTS OF THE PROGRAMME

The duration of the programme is approximately 3 years, including awareness-raising, involvement of companies and the implementation of the identified options. The programme starts with the project preparation. In the preparation phase the coordination with the government is sought, national environmental funds are involved, and chambers of commerce, institutions with previous RECP experience and other stakeholders are involved.

Analog to the duration and intensive assessment of the TEST instrument, the costs are substantially higher than many of the other instruments. An example form Jordan shows: The estimation of the cost per company was roughly € 20,000-€ 30,000. National and international experts worked with the companies for more than 40 days. The time needed by the companies was not specifically recorded, but it was estimated at a minimum of 1–2 days per month.

SAVINGS

Figure 13 shows the documented savings, as described in the programme reports.

By the end of the MED TEST II project, the 125 participating (demonstration) companies reported total annual savings of 3.5 million m^3 of water, 707 GWh of energy, 33,623 t of raw materials and 197,525 t in annual CO_2 emissions.

The average reduction in water consumption achieved by these companies was around 20 %. Energy consumption and the raw materials input per unit of products manufactured were reduced by 24 % and 5 % respectively. Extrapolating and projecting these figures in relation to the resource consumption of the entire manufacturing sector of the region would result in 76,667 GWh of energy and 700 million m3 of water saved per year.

The € 41.7 million of economic savings achieved by the 125 demonstration companies in the MED TEST II project are equivalent to the salaries of approximately 10,500 workers

(the different average salary scales of employees in the eight countries' manufacturing sectors were considered for this calculation). This underscores the fact that adopting RECP not only supports companies in their efforts to become more competitive and productive, but by creating new job opportunities RECP also gives them a better position from which they can expand their activities and retain the existing labour force. Detailed, country-specific reports are available on the project website: https://www.test-toolkit.eu/discover-more/

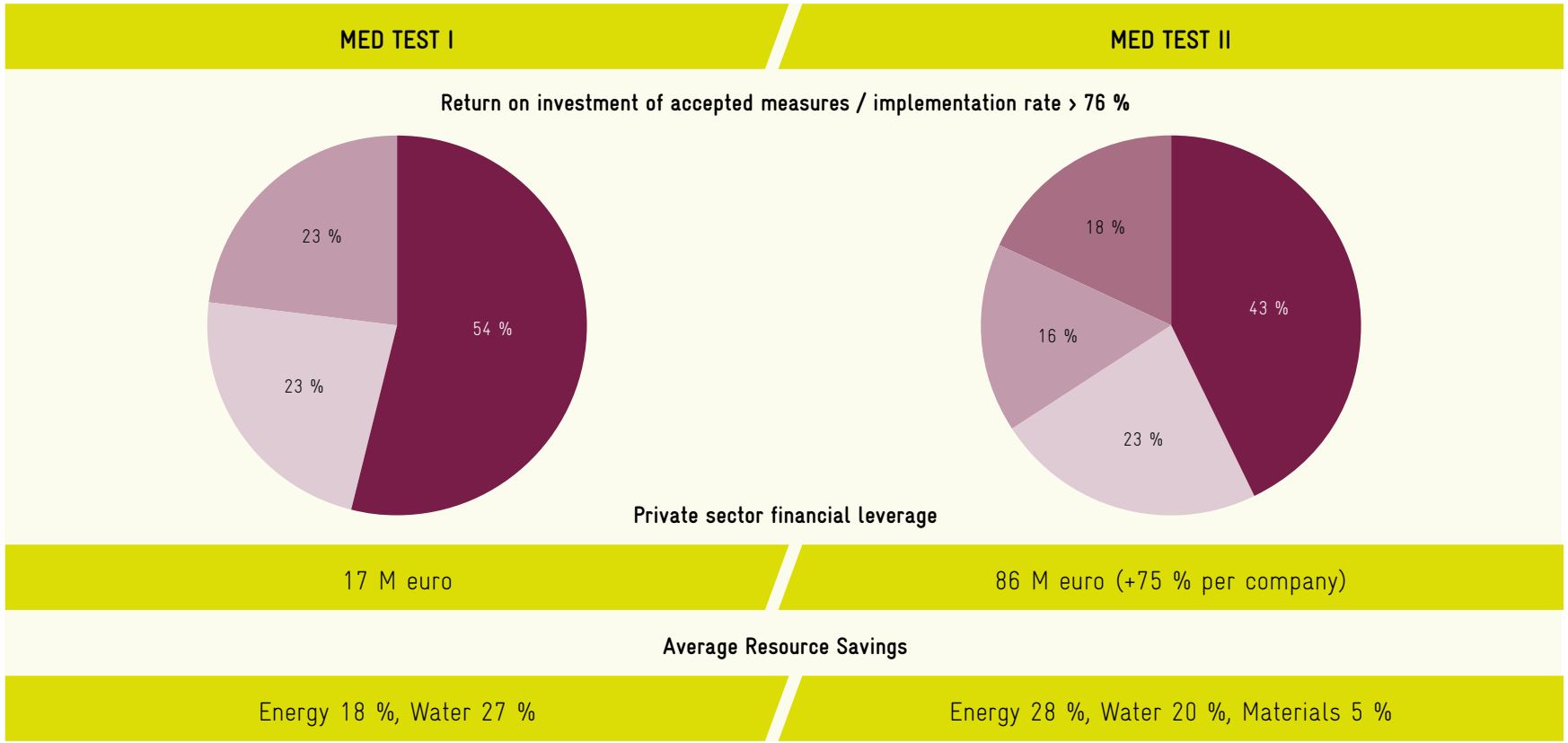


FIGURE 13: Savings achieved by MED TEST I and MED TEST II [22]

22 Source: https://www.test-toolkit.eu/discover-more/

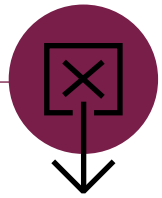
CASE STUDY FROM JORDAN



The GIZ Employment-oriented MSME development project in Jordan builds on an existing RECP project that is using the TEST instrument. The original project was implemented by the Royal Scientific Society (RSS) for UNIDO (Switchmed project – funded by the EU). The RSS/ UNIDO project targeted 12 medium and large sized businesses in Jordan, which collectively reported cost savings of JOD 1.6 million (€ 2.1 million), in addition to environmental savings such as water: 63,844 m3/year, energy: 22.1 GWh/year, and waste reduction: 82.64 ton/year.

The GIZ project will complement these efforts by

1. providing an MSME grant to RSS allowing them to design tools and service packages targeting micro and small businesses so they can also benefit from savings,
2. building the capacity of RSS enabling them to design and market financially viable services to MSMEs. This shall support MSMEs to have revenue generating streams that can help them become independent from external funding.



→ MORE LINKS

SUMMARY OF TEST

✓ STRENGTHS	– WEAKNESSES
The instrument provides a very detailed assessment of the company processes with the focus on resource efficiency. The implementation of measurement equipment is part of the instrument in several participating countries. The toolkit is ideal for generating demonstration cases in countries with comparatively high-quality infrastructures and good accounting practices (if high programme budgets can be made available for it).	High costs due to the intensive work with individual companies, the focus on data, the application of EMA, the measurements done, the involvement of international experts for the ToT, company assessments and additional technical experts to work on options. Funding for measuring equipment (only relevant equipment) is partially included in the project costs. Assessment takes 40 days, plus an additional maximum of 20 days for technical experts. General programme activities like preparation, marketing and evaluation constitute additional costs.
A defined baseline and the implementation of an information system ensure a continuous improvement cycle.	The standard of the requested data is very often unsuitable for the MFCA implementation.
A demand-driven approach. Training sessions are also provided to fulfill the needs of the participating companies.	The preparation phase needs one year on average. The approach is focused on individual consulting with single companies. When the programme ends, only one final workshop for participating companies is held for them to share their experiences.
The toolkit shows the costs involved in the non-productive output.	–
Linking to financing institutions is an integral part of the activities.	–

TABLE 5: Summary of the strengths and weaknesses of TEST

→ ITC RECP

KEY INTERVENTION	› Increasing the competitiveness of SMEs in international value chains through the reduced consumption of resources used in production processes, enhanced productivity and legal compliance › Involving key clients, international buyers and financing institutions › Development of national benchmarks and best practices during the preparation of the programme › Self-assessments, Personalized face to face coaching sessions, Technical group trainings based on needs assessment, Online trainings
TARGET GROUP / SECTOR	SMEs in international value chains so far, the instrument is implemented into the clothing, tea and coffee sectors but may be applied to other sectors
PROGRAMME DURATION	4–6 months for the coaching programme and 6 months for implementing the resource efficiency options (including support for the financing of investments)

TABLE 6: Overview ITC RECP

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

With this approach, the International Trade Center (ITC) aims to increase the competitiveness of SMEs in international value chains through the reduced consumption of resources used in production processes, enhanced productivity and legal compliance. The instrument is supported by the Swedish International Development Cooperation Agency (SIDA) and the German Federal Ministry for Economic Cooperation and Development (BMZ). Building upon best practices, the ITC works along international value chains to strengthen SME competitiveness. In this way, collaboration and an active dialogue is facilitated between value chain players – including international companies and local suppliers – opening up a path for the joint implementation of resource-efficient and circular production processes.

The ITC RECP instrument creates a direct link to financing options:

- Access to finance is the most important approach to implementing larger adaptation measures
- The requirements of finance providers (e. g., banks, impact investors) must be met
- Cost/benefit analyses based on net present value calculation form the basis for investment decisions
- SMEs must be able to communicate results to internal and external stakeholders

PROCESS

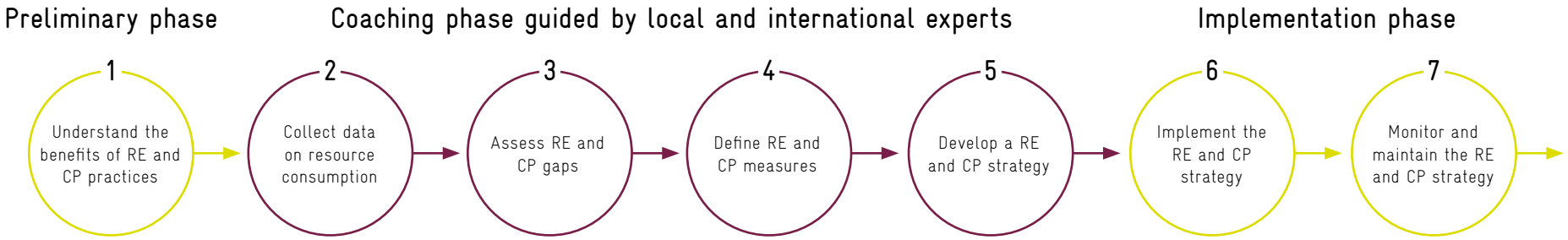


FIGURE 14: Steps of the ITC RECP instrument[23]

The coaching programme is based on the analysis of buyer requirements and on the performance of local SMEs in each target country and sector in terms of resource-efficient and circular production processes. Based on the results of these analyses, efficiency benchmarks for waste production and energy & water consumption are set at the specific SME level for each individual target country and sector.

At the start of the coaching programme, locally hired experts compare the performance of the selected SMEs to the set benchmarks. These experts then advise the SMEs on how to identify measures to enhance their resource-efficient and circular production practices, basing their advice on identified gaps. The shortlisted measures are assessed from a financial perspective and compared by means of a cost-benefit analysis.

23 Source: Strengthening the Competitiveness of SMEs in International Value Chains, Climate Change Adaptation, ITC

A resource efficiency strategy and an associated communication plan are then developed from the results. To ensure the implementation of the strategy, the SMEs also receive further guidance on how to access (green) finance, technology and expertise.

In parallel, the selected SMEs are enrolled in the 'Resource-Efficient and Circular Production Processes' online learning course hosted by the ITC SME Trade Academy. An ITC certificate is awarded upon successful completion of the course. The coaching programme is complemented by two in-depth workshops that deal with the selected SMEs' problems on how to implement resource-efficient and circular production practices. The workshop topics are jointly identified with suppliers and their international buyers. SMEs also benefit from training and guidance on how to access (green) finance. This ensures the implementation of the identified measures for which external financing is needed.

The areas addressed by the ITC RECP instrument are shown in Figure 15 (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage).[24]

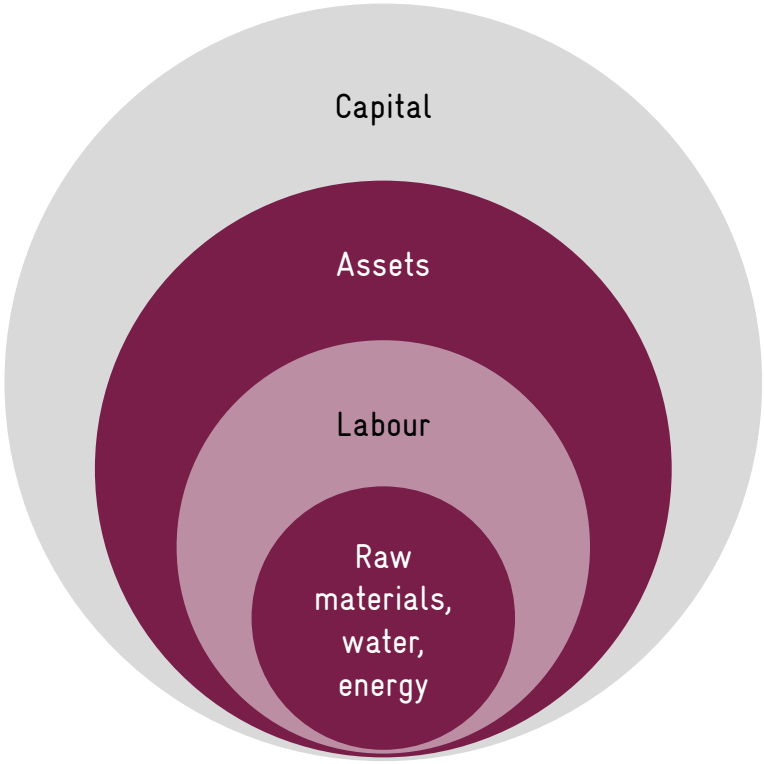


FIGURE 15: Onion skin chart for the ITC RECP

SMEs/cooperatives design a climate change adaptation strategy in order to achieve the following goals:

1. Strengthen competitive advantage by investing in innovative measures and increasing production efficiency.
2. Lower operation costs by using available resources more efficiently.
3. Anticipate new climate change-driven regulations.
4. Develop new ranges of products and services that meet new climate change-driven requirements.

24 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources.

TARGET GROUP

The instrument's target group is SMEs in international value chains. The instrument is implemented into the clothing, tea and coffee sectors. Documented case studies for other sectors are not yet available. We assume that the approach is not limited to the already documented sectors, since e-learning modules for other sectors can be prepared and benchmarking studies can be completed thanks to the use of (technical) sector experts during the coaching phase of the instrument.

COUNTRIES OF IMPLEMENTATION

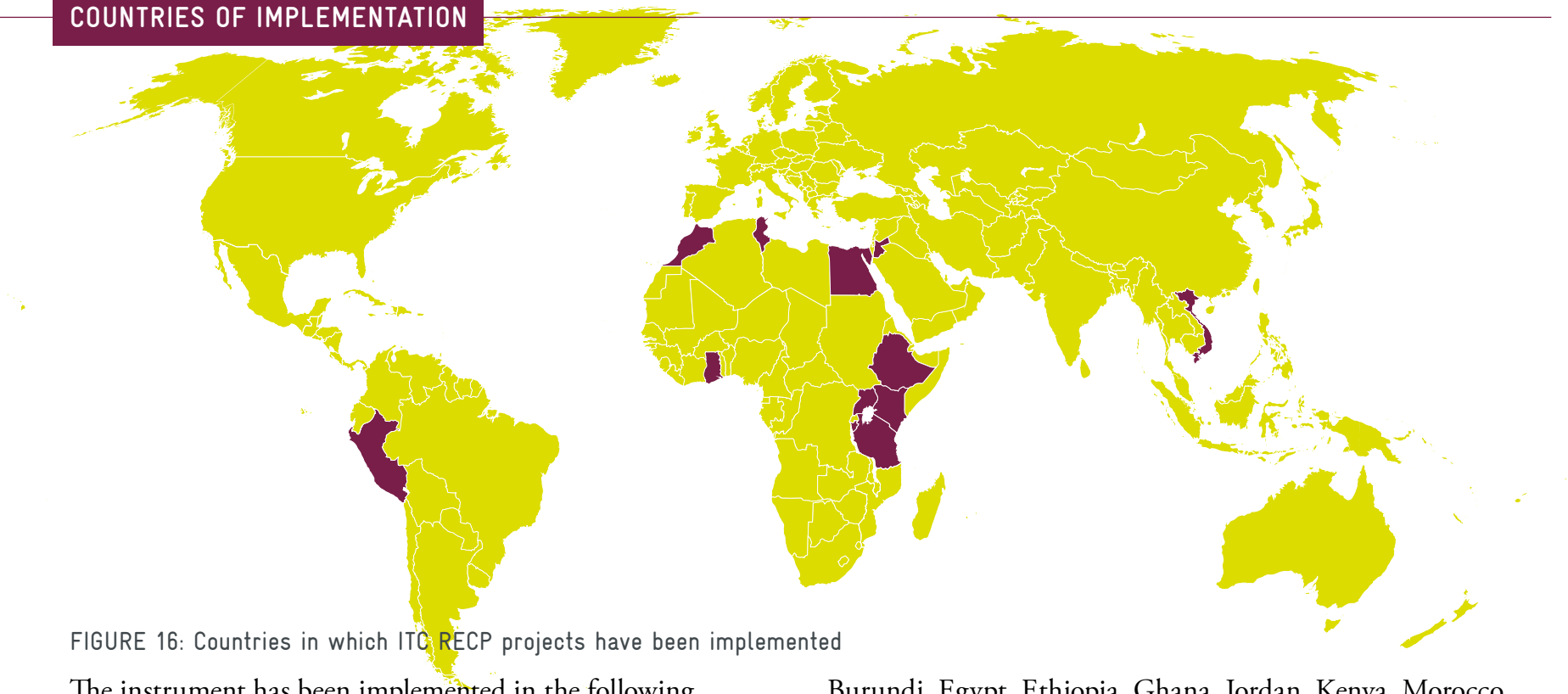


FIGURE 16: Countries in which ITC RECP projects have been implemented

The instrument has been implemented in the following countries:

Burundi, Egypt, Ethiopia, Ghana, Jordan, Kenya, Morocco, Peru, Tanzania, Tunisia, Uganda and Vietnam.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

To successfully implement an RECP project, the ITC specifically focuses on the following factors:

- Geographical focus (country, region, etc.)
- Focus on specific sectors and sector-related export/investment potential
- Working with local project partners and funders
- Focus on specific challenges in the target location/sector (e. g. representation of women, challenges for youth, climate change, pollution, working environments)

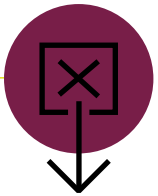
DURATION AND COSTS OF THE PROGRAMME

The programme duration is 4–6 months for the coaching programme and 6 months for implementing the resource efficiency measures (including support for the financing of investments).

The example from Vietnam may provide some indication of costs for local experts. Their payment amounted to USD 600 for 15–20 days working with a company. One expert can coach up to 5 companies. The ITC works with existing expert networks such as the UNIDO NCPC.

SAVINGS

Case studies in terms of savings are neither available on the Internet, nor have they been provided by the interviewee.



→ MORE LINKS

CASE STUDY FROM ETHIOPIA



A BMZ funded pilot project using the ITC RECP instrument was implemented in in Ethiopia in 2019 with the objective to strengthen the competitiveness of the Ethiopian textile and clothing sector through RECP processes. The pilot project worked in close collaboration with the GIZ eTex programme in Ethiopia.

After the selection of the five beneficiary companies, the programme included the following activities:

1. Self-assessment survey: The SMEs completed a survey about their practices related to water, energy, chemical use and waste management, which resulted in the baseline assessment of each beneficial company. Each baseline assessment was complemented by stakeholder consultations with sector and government stakeholder.

2. Personalized coaching programme: The three days coaching sessions included an assessment of the initial performance of the company, joint development of measures to enhance resource efficiency and to introduce circular production practices and the preparation of the measures along with a business strategy.

3. Group Trainings: Three group training sessions were held on the topics Environmental Standards for the Ethiopian T&C sector, Energy management system and energy audit and Water Management and Wastewater Treatment.

4. Access to Finance: ITC developed a study of the overall landscape for (green) financial services available for SMEs, including the procedures and requirements set by the different financiers to serve SMEs. The study was then used as a basis for further personalized coaching for three companies in order to assess their financial needs for RECP measures.

5. Along these activities several awareness raising activities provided the option to discuss the challenges and opportunities related to RECP in the Ethiopian textile and in the textile and clothing sector. For example, a one-day sensitization workshop held in the preparation phase of the project introduced the ITC project and facilitated discussion with Ethiopian industry and government stakeholders.

Together with the consultants the five companies identified 27 different measures with an average of three to seven measures per company, for which viable business cases were confirmed. Some quick-win measures were already implemented by the companies during the project implementation phase e.g fixing leakages, improving waste management in accordance with standard practices, recycling light polluted water and improving inventories and chemical policies. The long-term resource and cost-saving potentials seemed promising[25], however, the authors of this document were not able to verify whether the predictions held true after implementation as there are no evaluated case studies of individual companies available yet.

25 The calculations suggested an annual savings potential of almost USD 500k per year with corresponding one-time investment cost of less than USD 150k. The payback period for the measures ranged between 0-5 years. Next to potential cost savings, the project identified resource savings potentials of 100k m3 of water, 10m kWh of electricity, 40k kg of chemicals, 200 k litres of fuel and approx. 2k m3 of wood.

SUMMARY OF THE ITC RECP INSTRUMENT

✓ STRENGTHS	– WEAKNESSES
At the beginning of the programme, national benchmarks and best practices are defined to specify the starting point and create a need-driven project plan.	Only works well for homogenous sectors (e.g exchanging experiences, sharing of similar/identical problems) and well-organised enterprises with good access to data.
Involves key clients and international buyers: The benefits include a reduction of climate-driven supply chain risks, plus solid collaboration and active dialogue with their suppliers, creating lessons learnt for the potential replication of the project.	Applying pressure to national suppliers appears to be an element of the methodology here – and it seems that this approach is also used by major enterprises to consolidate their supply chains.[26]
Involvement of financing institutions: Commercial and development banks as well as traditional and impact investors are invited to take part in the project. Financiers can access a wide portfolio of interesting projects to access the products.	The financing institutions provide loans to the SMEs at national market conditions. The instrument itself provides neither subsidies nor subsidised loans.

TABLE 7: Summary of the strengths and weaknesses of the ITC RECP instrument

26 Authors' interpretation

→ ECOPROFIT

KEY INTERVENTION	Regional implementation of RECP, using elements of experienced-based learning in group-settings in order to identify technical and organisational measures to improve RE.
TARGET GROUP / SECTOR	Industrial companies (SMEs) in all industries, plus service providers A condensed version also targets micro-enterprises and the hospitality industry
PROGRAMME DURATION	Basic Programme: 3-5 days of individual consulting over a period of 10 months RECP Club Programme: 3 workshops annually, 3 working groups, company visits and an award upon successful completion.

TABLE 8: Overview ECOPROFIT

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

In 1992, the development of the ECOPROFIT model was launched on behalf of the City of Graz, Austria. It was aimed at involving regional companies in preventative measures to support environmental protection. The Cleaner Production approach of the US EPA was converted into a group-based approach to build low-level management systems (note that key elements of the ISO 14001 standard have been implemented, but not all the requirements of the international standard such as the definition of process procedures or documentation are included in the ECOPROFIT instrument). Elements such as the workshop model, the use of peer groups for mutual motivation and an award were developed. The instrument consists of workshops attended by company representatives, who learn about tools that identify potential to reduce environmental issues and costs and how to use these tools. The length of the workshop phase differs from context to context. In the GIZ project in India the companies participated in six workshops.

ECOPROFIT is usually carried out with companies from different sectors, but from a single region. Ideally, the municipality, city or district is the programme executing agency and the chamber of commerce, labour association, regional university of applied sciences, etc. are involved. Apart from

producing economic savings and enhancing the integration of environmental protection, ECOPROFIT also examines the legal requirements of the companies, ensuring compliance with environmental legislation.

PROCESS

In the workshop participants receive organisational and technical support from a team of consultants, learn how to draft and implement action plans and to implement at least three measures. They create reports and are shown how to earn an award from the municipality. Textbooks are available to support the learning process in the workshops. Worksheets also help the self-assessment process in the companies, which is done as homework after each workshop and which covers the topics of an environmental report and a waste management concept (see Figure 17). Individual coaching and organisational and technical consulting is also provided. After the first year in the basic programme, companies can continue the programme in a 'Club' with three annual workshops on relevant topics and with working groups, mutual visits and individual consulting.

WORKSHOP TOPICS

- Introduction to CP
- Team work
- Policy
- Motivation
- Legal compliance
- Material flow analysis
- Energy analysis
- Indicators, monitoring
- Environmental management system
- Materials efficiency
- Chemicals
- Procurement
- The efficient use of water
- The efficient use of energy

WORKSHEETS

- Waste management plan
- Environmental report
- Action plan
- Documentation of implemented measures

INDIVIDUAL CONSULTING

- Coaching
- Measurements
- Company visits

FIGURE 17: Workshop topics, worksheets and individual consulting components of ECOPROFIT

The areas addressed by ECOPROFIT are shown in Figure 18. (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage).[27]

The workshop structure is focused on topics (introduction to RECP and input/output, policy and team, material flow analysis, energy analysis, monitoring and controlling, purchasing) and on media (chemicals, water, energy, materials) – so the modules of the instrument cover all sectors. The spectrum includes hospitality, modifications for metal manufacturing and the targeting of a variety of industries. A version has also been specifically designed for micro-enterprises.

The instrument focuses on increasing resource efficiency and implementing the action plan.

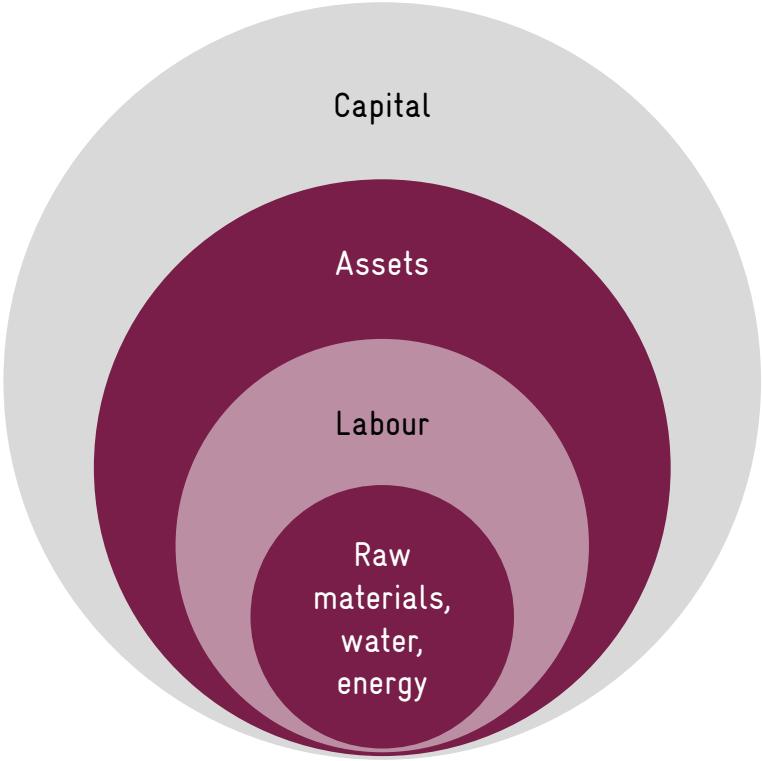


FIGURE 18: Onion skin chart for ECOPROFIT

TARGET GROUP

The instrument targets SMEs, while a condensed version also targets micro-enterprises and the hospitality industry. The programme addresses industrial companies in all industries, plus service providers. For example, there are targeted programmes for tourism, hospitals and administrative bodies.

27 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources.

COUNTRIES OF IMPLEMENTATION

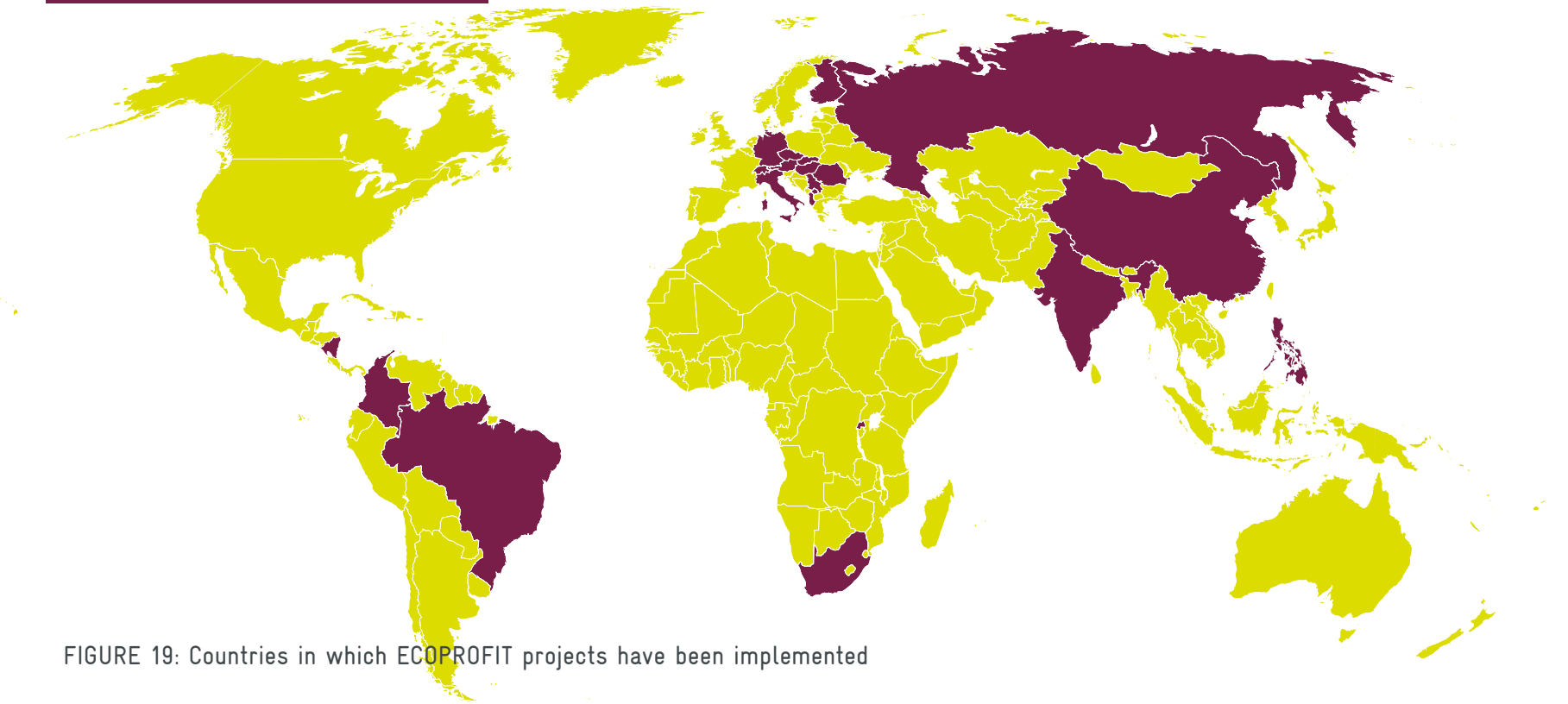


FIGURE 19: Countries in which ECOPROFIT projects have been implemented

Figure 19 shows the countries where ECOPROFIT projects have been implemented: Albania, Austria, Brazil, China, Colombia, Czech Republic, Finland, Germany, Hungary, India, Italy, Kosovo, Nicaragua, Philippines, Romania, Russia, Rwanda, Serbia, Slovakia, South Africa, Switzerland and Uganda.

The ECOPROFIT approach was successively used in other regions in Austria and in Germany, Slovenia, Italy, Hungary, Korea, China and Colombia. Modified models of the approach were also used in South Africa, Nicaragua and Brazil. UNIDO uses a condensed version of the model in the form of the 'RECP Club' in Belarus, Ukraine, Moldova, Georgia and Armenia. An estimated total of 2,500 companies have already taken part in the ECOPROFIT programme.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

There are no specific requirements for participating companies. Experienced consultants are recruited on a national scale. Training programmes for consultants have been held in several countries.

The minimum of ToT for a certified ECOPROFIT trainer comprises

- 5-days of classroom training in the ECOPROFIT approach classroom workshops
- 2 visits to companies (baseline and quick wins) facilitated and supervised by an RECP expert trainer
- Support of 1 ECOPROFIT programme supported by an experienced trainer.

DURATION AND COSTS OF THE PROGRAMME

Duration: In the original version, the basic programme provided 10 one-day workshops over a period of 10 months. This has been changed to 3–5 days of individual consulting.

ECOPROFIT Club: The Club-Version provides 3 workshops annually, 3 working groups, company visits and an award upon successful completion. Depending on the region, 10 % to 50 % of companies participate – some even for 20 years (in Graz and Vorarlberg). Local variants exist (half-day workshops, fewer workshops, company visits in advance).
A participation fee is usually charged (€1,000 to €3,000 per company and year in Austria and Germany, €1,000 per company in India).

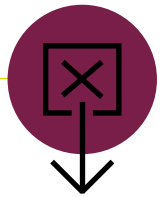
SAVINGS

Several databases exist (Austria, Germany, India (acquired from documentation)) in Colombia, Nicaragua, South Africa, Uganda, India, China, Korea, Germany, Slovenia and Hungary. In Belarus, Ukraine, Moldova, Armenia and Georgia, the 'RECP Club' modified version is in use.

EXAMPLE:

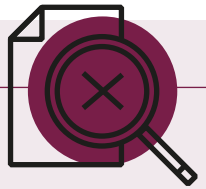
Documented savings achieved by the ECOPROFIT Munich
In total, the measures save 8.9 million kWh of electricity, heat and fuel, which result in an annual reduction of approximately 4,600 tonnes of CO_2. Waste production and the use of raw materials have been reduced by 100 tonnes and 8.5 tonnes respectively. Companies can expect savings of nearly €1.9 million as a result of participating in ECOPROFIT. 10 new companies joined ECOPROFIT in 2015. 18 companies participated in ECOPROFIT Energy which was offered for the first time following new energy legislation in Germany. 29 companies parti-

cipated in the ECOPROFIT Club programme and continued to improve their environmental and competitive performance. Two of the Club companies carried out the ECOPROFIT Energy scheme at the same time.[28]



→ MORE LINKS

CASE STUDY FROM INDIA



Project/Country	Sustainable and Environment-friendly Industrial Production (SEIP)/INDIA
Objective of the Project/Objective of the activity	To improve environmental performances of the industries (SMEs) and make them resource efficient. This provides the basis for promoting cleaner, safer and resource efficient production programmes.
Time Frame in which the instrument was/is implemented	2000 to 2012
Target Group	Industries, Hotels, Industry associations, State Infrastructure Development Corporations, Experts
Sectorial Focus	Automobiles, Pharmaceuticals, Metal Processing, Beverages, FMCG, Hotels
Additional Activities supporting the target group	Ecoprofit tools for calculation, practical trainings, On the job consultations, Award and Recognition for performance
Trainer/Consultants	National Experts from GIZ and Stenum Asia and International Experts from Stenum GmbH, Austria

28 Source: https://www.muenchen.de/rathaus/wirtschaft_en/business-news/ecoprofit-munich_benefits.html

Implementation Partners	Industry Associations of NCR region and APIIC in Andhra Pradesh, Himachal & Tirupati Municipal Corporations for Hotels
Output/Outcome	Minimum Return On Investment (annual) was about four times higher in comparison to the programme cost paid by companies. Highest ROI documented was 1:28 and average ROI documented was 1:6. In addition, significant environmental benefits, improved performances and enhanced employee satisfaction.
Sustainability of outcomes	Various industries and hotels implemented the Ecoprofit concept in their other industries and hotels. Cleaner production services are now provided as professional service on fee basis by Stenum Asia in India.
Costs for project	Approximately INR 100,000 per industry for a programme of one year with funding support of national experts by cooperation partners.
Success Factors	› Capacity building of technical and management staff resulted in dedicated involvement in process (Trainings). › Improvement measures were subsequently considered, designed, and implemented with economic justifications. › Need for skill development mechanisms for RECP through educational institutes or certification agencies › Need to integrate RECP as tool for environment management practices and norms within industries (not integrated in ISO norms) › Comprehensive incentive framework for the adoption of sustainable consumption and production practices › RECP initiatives highly appreciated by European clients

TABLE 9: ECOPROFIT – Case Study from India

SUMMARY OF ECOPROFIT

✓ STRENGTHS	– WEAKNESSES
The true cost of waste is output (non-productively). This is usually an 'iceberg' with most of the actual costs of waste hidden.	Expense: a network of technical experts is needed in a supporting role to continuously introduce new ideas, perform professional analyses and create links to potential suppliers.
Elements of organisational and technical consulting on demand are combined into one programme, including elements of experience-based learning (fun factory, coffee-making, role playing); organisational and technical measures are also identified.	The availability and time of the environmental team: The effort involved in hosting 6 to 10 workshops, plus an average of 3 days of consulting (both internal and external).
Clear structure with worksheets created by the company representative and an expert; all media are basically covered, with demand-based priorities.	Long-term continuation and success are mostly dependent on being rooted in an institution such as a municipality or chamber of commerce, etc.); the flow of ideas may dry up after only a couple of years.
Established roots to ensure continuation: This is basically a low-level environmental management system, with certification and award upon completion. A simple baseline, indicators, monitoring and controlling exist at the individual company level.	–
A group-based approach helps to build a community of like-minded company representatives, supports the sharing of experiences, uses swarm intelligence and soft peer pressure.	–
Basic programme plus a Club programme for continuation; companies remain in the programme for 10 to 20 years, depending on the Club programme.	–
The award shows that the company being presented is a 'model of good corporate citizenship'.	–

TABLE 10: Summary of the strengths and weaknesses of the ECOPROFIT instrument

→ PREMA

KEY INTERVENTION	Aims at four wins at company level: **1.** Reduction of production costs and increase in productivity and competitiveness **2.** Improved environmental and climate performance, increased resource efficiency **3.** Strengthening of organisational capabilities and implementation of change **4.** Efficient management of risks and selected social aspects. Group approach based on experiential learning and co-generation of results. The focus lies on reduction of „Non-Product Output" (NPO) and change management.
TARGET GROUP / SECTOR	Micro-enterprises, SMEs, service providers as well as schools, economic clusters, supply chains and industrial areas; Can be used in all industries.
PROGRAMME DURATION	Overall 4-6 months: 5 days basic training module (day 3 is an on-site-diagnostic in participating companies); Follow-up consultancy for each company on site 2-3 days; Participation in company network with 3 days of group counselling.

TABLE 11: Overview PREMA

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

PREMA (Profitable Resource Efficient Management) helps companies implement four improvements.

1. Reduction of production costs and increase in productivity and competitiveness
2. Improved environmental and climate performance, increased resource efficiency
3. Strengthening of organisational capabilities and implementation of change
4. Efficient management of risks and selected social aspects.

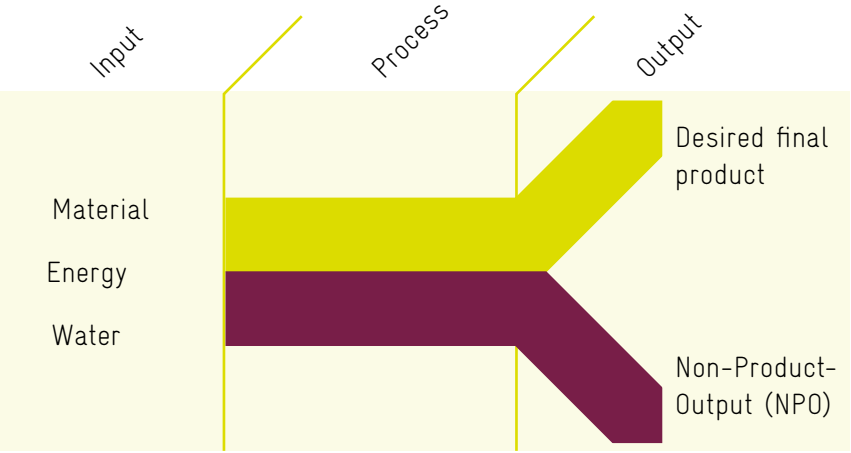
The implementation of PREMA differs slightly depending on the country, the partner institution, and the target groups. The basic PREMA training module of five days is implemented to achieve the four wins by implementation of at least three

documented resource-efficiency measures per company. The training content encompasses resource management, good housekeeping and environment oriented cost management. The main analytical element of PREMA is the Non-Product Output (NPO) approach. Participants first analyse their individual production processes. They then define process steps and the related inputs, plus the desired and unwanted outputs (NPO).
One apt description of NPO is the sum of all the materials, semi-products, energy and water which are used in the production process, but are not part of the final product. When companies start to link the waste of resources to their financial losses, this automatically triggers ideas for improvement. PREMA trainers coach companies on step-by-step sustainable solutions. This innovative methodology requires little investment and can be done in short-term cycles. Figure 20 explains the concept of non-product output (NPO).

PREMA follows the six steps of the cycle of change to ensure sustainable improvements:

- Fact finding – process analysis
- Consensus building – analysis of costs and environmental impact
- Mobilisation of energy – analysis of the causes of problems
- Action – development of improvement measures
- Change – implementation of improvement measures
- Evaluation – integration into company structures

PREMA trainers also teach skills in presentation, visualisation, moderation and team-building. These skills are required to effectively implement measures and to motivate staff to become more NPO-aware. PREMA enhances the problem-solving capacities of employees and promotes networking between departments – and even between companies in the same sector.[29]



NPO = all the materials, energy & water which are used in the production process, but are not part of the final product.

FIGURE 20: The concept of non-product output[30]

29 Source: https://www.premanet.net/about-prema/our-concept
30 Source: https://www.premanet.net/about-prema/our-concept

PROCESS

Training sessions are carried out in the form of interactive workshops (3–5 days) for owners and/or managerial staff. The sessions are conducted by qualified trainers, and networking meetings for the participants (lasting 1 day) provide a forum for peer consultancy, problem-solving and general support for the change process.

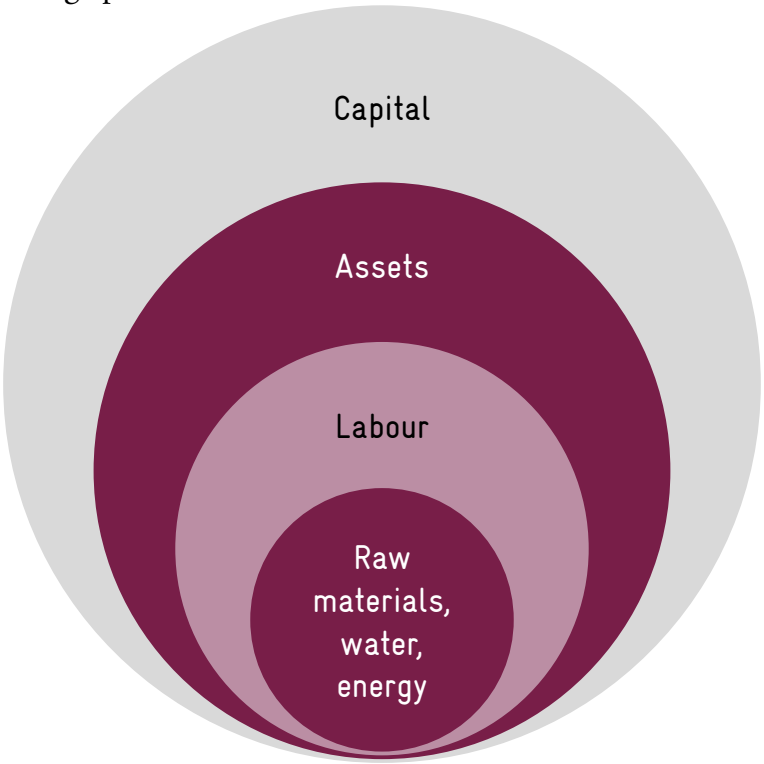


FIGURE 21: Onion skin chart for PREMA

Figure 21 shows the onion skin chart for the PREMA instrument (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage).[31]

The instrument is oriented on the practical needs of MSMEs and focusses on increasing ressource efficiency by implementing the respective action plan.

The basic module focuses on involving as many SMEs as possible in low-cost analyses of their strengths, NPO and optimisation potential. The aim is to show them how to develop and implement measures within a relatively short timeframe and with either not much investment, or none at all.

31 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources.

TARGET GROUP

PREMA is designed for micro-enterprises, SMEs, service providers as well as schools, economic clusters, supply chains and industrial areas.

Some 2,500 persons all over the world have been trained in PREMA. The instrument has been used in all possible industries.

COUNTRIES OF IMPLEMENTATION

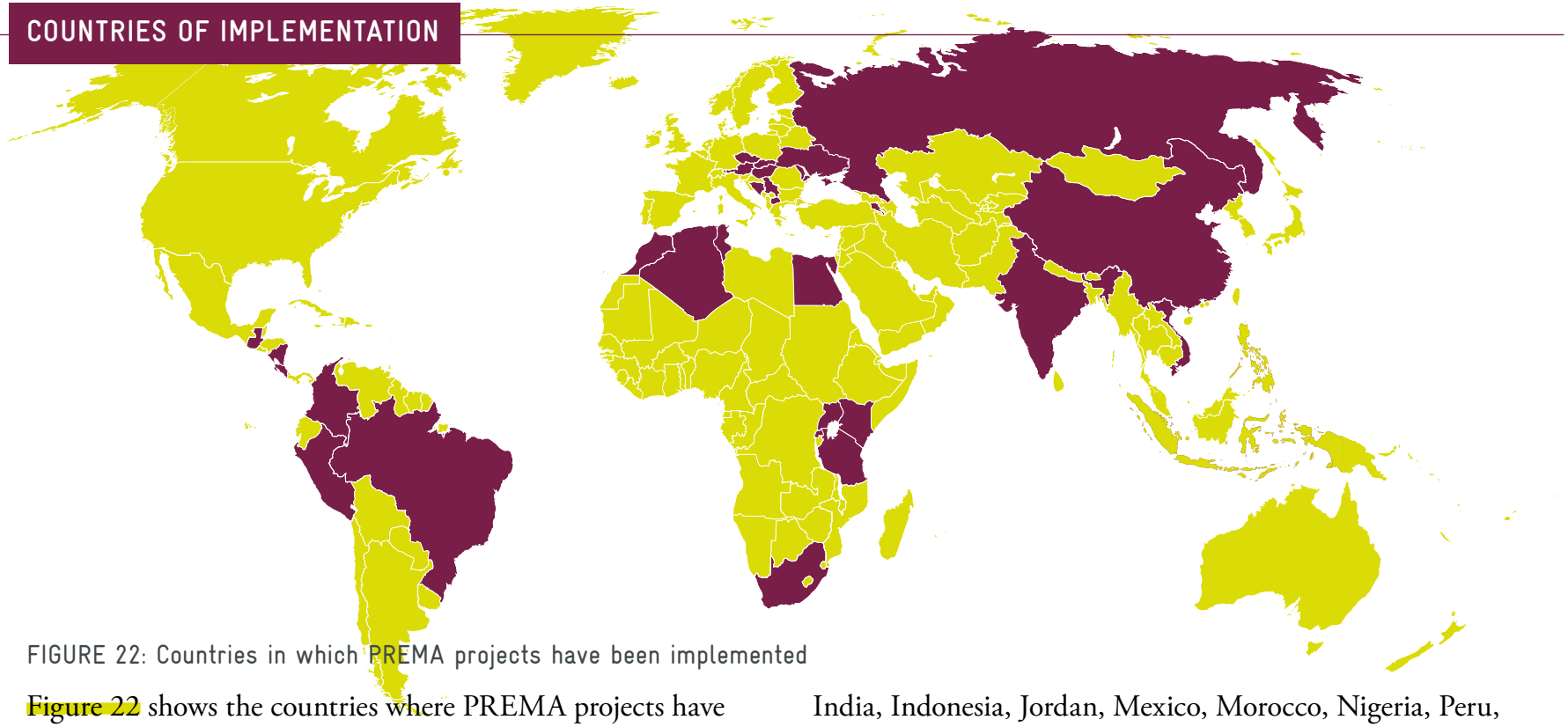


FIGURE 22: Countries in which PREMA projects have been implemented

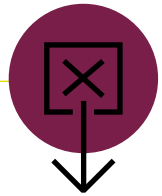
Figure 22 shows the countries where PREMA projects have been implemented: Algeria, Armenia, Bangladesh, Bolivia, Brazil, Cambodia, Chile, China, Colombia, Costa Rica, Cuba, Ecuador, Egypt, El Salvador, Germany, Ghana, India, Indonesia, Jordan, Mexico, Morocco, Nigeria, Peru, Philippines, Romania, Sri Lanka, Thailand, Tunisia, Turkey, Uruguay, Venezuela, Vietnam, and Zimbabwe.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

No specific requirements for participating companies exist. Experienced consultants are recruited nationally and training programmes for consultants have been hosted in several countries.

Trainers take part in the 'training-of-the-trainers' (ToT) programmes. The programmes supplement trainers' profiles by teaching them necessary and diverse skills such as communication and moderation, subjects which are key features for effective, customer-oriented consulting.



→ MORE LINKS

DURATION AND COSTS OF THE PROGRAMME

The overall programme will last 4–6 months including:

- Training: 5 days Basic module, day 3 is an on-site-diagnostic in participating companies
- Follow-up consultancy for each company on site 2–3 days (depending on size of company)
- Participation in company network: 3 days of group counselling (last meeting possibly final evaluation + public event)

COSTS:

The programme costs 1.500 € – 5.000 € per company depending on the number of companies (5–10), size of companies, cost of trainers and training venue.

SAVINGS

The savings vary depending on the character of the three measures chosen by the company, the company size, the product, the value of resources in the country, etc. PREMA programmes have proven that all companies can at least save the full cost of the training in the first year after the training. Most companies experience up to three additional benefits related to the environmental-climate, organisational culture, risk management and social aspects.

PREMA IN GIZ – CASE STUDY ARMENIA



Project/Country	Private Sector Development and Technical Vocational Education and Training South Caucasus (PSDTVET) SFF Measure: „Promotion of sustainable resource management in private companies“
Objective of the Project/ Objective of the activity	Strengthen the capacity oh the SME Development Agency for introducing new advisory tools for SMEs
Time Frame in which the instrument was/is implemented	3 years (2013–2015 + additional ToT in 2018)
Target Group	Small- and Medium-sized Enterprises (10–150 employees)
Sectorial Focus	Mixed: Juice Production, Chocolate Production, Vegetable Production, Metal Production
Additional Activities supporting the target group	As this was the only activity funded by the SFF, there was no further activities from the project targeting the SMEs
Trainer/Consultants	› Local trainers came from SME development agency and other institutions and were trained in ToT (one week) by two international Master trainers. › From the group of local trainers the GIZ project selected the six best trainers for conducting the training with the SMEs. › In the first round of the SME trainings the international trainers led the training and the local trainers assisted and learned; in the second round the local trainers led the training and the international trainers supported.
Implementation Partners	SME Development Agency
Output/Outcome	› More than 50 SMEs trained › RECP measures with SMEs identified and implemented › Creation of an expert pool of 6 trainers, who still implement today (always through development organizations like GIZ)

Sustainability of outcomes	› More than 50 SMEs trained › RECP measures with SMEs identified and implemented › Creation of an expert pool of 6 trainers, who still implement today (always through development organizations like GIZ) › The instrument teaches the SMEs the tools they need in order to become more resource efficient, so that they can continue to apply them themselves. › Local trainers have continued to use the PREMA instrument and knowledge, e.g. in vocational schools to teach students about resource efficiency. › After 6 months the project organized group meetings for SMEs who had participated in the training. This provided the opportunity for them to exchange experiences and for the project to follow up on their activities.
Costs for project	150.000 Euro (including international and local trainer)
Success Factors	› Project selected relevant SMEs and approached them personally: Project staff and int. trainers visited SMEs, presented the training, explained procedures and already identified some of the potentials for resource efficiency in the respective SME. This helped to gain the trust and buy-in from the SMEs. › It is important that SMEs understand that PREMA is also a management tool as it leads to better profitability. This should be prioritized in the communication towards the SMEs. › Additional grants are helpful to ensure the financing of implementing identified activities of the SMEs › The success of PREMA in the SME depends on the business climate and management attitude towards change. In some companies, employees have identified potential for change, but if the management is not open to change the necessary activities will not be implemented.

TABLE 12: PREMA – CASE STUDY FROM ARMENIA

SUMMARY OF PREMA

✓ STRENGTHS	– WEAKNESSES
Needs-based, setting of priorities by means of the NPO approach, compliance adherence and more efficient quantities	One of the value prepositions of PREMA is the simplified application of the NPO concept as it can serve as an eye-opener for companies. However, it is difficult to apply in companies without proper accounting of input materials, energy, water, and waste.[32] The approach is especially not easy to manage in countries with 'grey' accounting.[33]
Experience-based learning (greeting card exercise) with case studies, e.g. 'Does not need a technical approach'; group-based (ideally 10 companies)	Technical consultancy is not a systematic methodological element of PREMA. Therefore, depending on the previous education and experience of the involved trainers and consultants, a different level of technical consultancy will be provided to the companies.
Focused on NPO	The marketing of PREMA by national consultants is often weak. The support by PREMAnet through a training needs to be enhanced.
The main difference between PREMA and other instruments is the concept of non-product output, plus 16 key areas that are defined to reduce cost and environmental aspects: the building up of capacities and motivation; the creativity of participants, workers and management is also exploited to discover ideas, and experiencing change is a motivating factor	

TABLE 13: Summary of the strengths and weaknesses of PREMA

32 One interviewee pointed out that cost saving is not always the most important or appropriate strategy for every company. Depending on the prevalent strategy of the company, the focus can be the availability of materials, water and energy, availability of capital, machines, process bottlenecks, market penetration or new products.
33 With 'grey accounting', the authors mean that not all expenses and revenues are fully reflected in an accounting system, nor can they be retrieved from it.

→ UNIDO RECP

KEY INTERVENTION	Providing capacity building for carrying out preliminary and full assessments and supporting implementation of measures. Supporting activities are: › Technology transfer, visits, study tours › RECP awareness-raising › Policy advice to integrate the preventive principle into national legislation Operates through well-established National Cleaner Production Centres.
TARGET GROUP / SECTOR	SMEs in developing countries; also useful for larger companies model is easily adaptable to sectors with a specific focus (e.g., garments, food, water, chemicals, etc.)
PROGRAMME DURATION	ToT: Original training plan lasts 5 days, work with a company and final report takes 3 days. RECP Assessment: work with a company, usually spread over 3 to 5 months RECP Club (UNIDO model): workshops and consultancy usually spread over up to 6 months

TABLE 14: Overview UNIDO RECP

DESCRIPTION OF THE INSTRUMENT

APPROACH AND KEY INTERVENTIONS

UNIDO's RECP instrument is implemented using a classic approach and in some cases by subsequently offering an RECP Club for companies that would like to have further support:

› **The classic approach** consists of two stages: preliminary assessment and full assessment carried out by a qualified external consultant who collaborates with an internal team. These are supported by a national cleaner production centre with its pool of experts.

1. The preliminary assessment includes a survey, a short company visit and an identification of first topics relevant for the company. This assessment serves as a first overview and shall motivate companies to take the next steps.
2. The full assessment builds on the preliminary assessment and includes the mapping of material, water and energy flows, assessing efficiency and losses, establishing priorities, performing root-source analyses of the reasons behind waste, identifying options, performing feasibility analyses and supporting the implementation process.

› **RECP Clubs** include acquisition, first visit; 4 to 8 common workshops, 2–3 visits from experts, additional work with companies with supporting slides, worksheets and a reader.

Supporting activities are:

› Technology transfer, visits, study tours

› RECP awareness-raising

› Policy advice to integrate the preventive principle into national legislation

National adaptations were developed within the network of the RECP network.

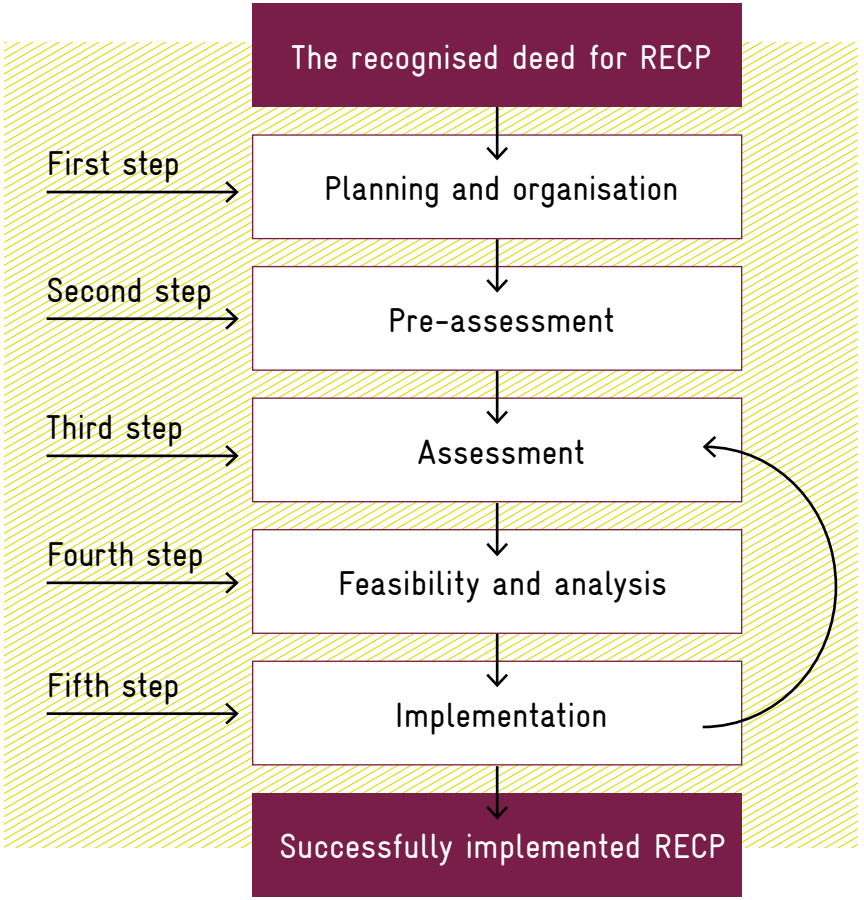


FIGURE 23: Steps for the successful implementation of 'classic' RECP in plant assessment[34]

34 Source: Staniskis, J., Katiliute, E. (2016): Systems Approach to Resource-Efficient and Cleaner Production Solutions: Method and Implementation, Sustainability Through Innovation in Product Life Cycle, Design pp 385-398 Springer Verlag

PROCESS

The RECP ToT programme to create national capacities consists of 12 modules: Introduction to RE, the Team and Policy, Indicators, Materials, Chemicals, Water, Energy, Procurement, Monitoring and Controlling, Environmental management, Eco-design and Regional approach. The certification training minimum for an UNIDO RECP ToT takes 6 months and includes:

- 5 days of classroom training in the RECP approach classroom workshops
- 2 visits to companies (baseline and 'quick wins') facilitated by a RECP expert trainer
- 10–20 working days spent with a company to learn how to perform a full assessment.

Figure 23 shows main steps for the implementation of a project using UNIDO's RECP instrument.

The areas addressed by the UNIDO RECP instrument are shown in Figure 24. (Color key: light red areas have partial coverage, the areas in light gray have no coverage, areas in red have good coverage)[35]

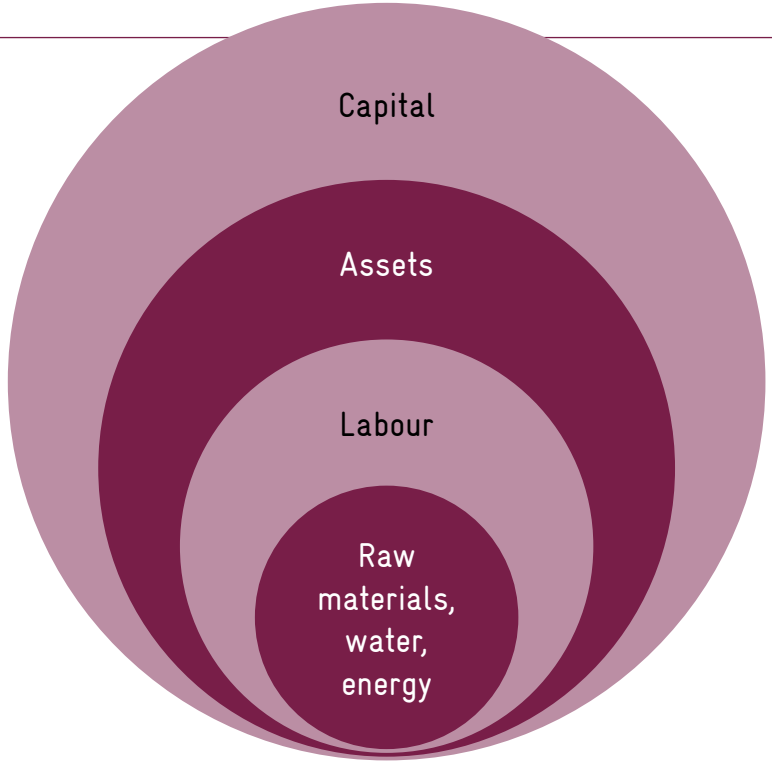


FIGURE 24: Onion skin chart for the UNIDO RECP instrument

One suggestion is to study the model of LEEN networks[36] (Learning Energy Efficiency Networks), where an expert audit is carried out before the workshop series starts. The benefit here is that the sharing of experiences is more focused and companies can present actual implementations from the outset.

35 Capital = investment, working capital; Assets = machines, buildings, land use; Labour = better working conditions; Raw materials, water, energy = the improvement of a company's efficiency with resources.

36 Source: LEEN GmbH, Schönfeldstraße 8, D-76131 Karlsruhe, Germany, E-Mail: peter.tamas@leen.de, dirk.koewener@leen.de

It's an effective motivator for others when somebody says, "We actually implemented this!" There is also a fast-growing trend towards online meetings.

The UNIDO RECP instrument demonstrates the environmental, financial and social benefits of RECP through in-plant assessments. The concept can be applied to any industrial sector, and it can not only benefit natural and social environments, it can also generate profits for the industry.

The NCPCs usually provide help to obtain financing for RECP investments. A policy advisory service is also provided to connect local governments with companies. This helps each government to identify and develop the policy tools and economic instruments that match the conditions and requirements in its country, thereby promoting the sustainability of the programme. The instrument focuses on increasing resource efficiency and implementing the action plan.

TARGET GROUP

This approach targets SMEs in developing countries and is also useful in larger companies where there are fewer problems, such as the availability of a team, sufficient data, and information on the technologies used.

The model can be easily adapted to sectors with a specific focus (e. g, garments: light, small machines, food, water, chemicals, etc.). Normally, the general approach used does not change. The RECP practitioner resembles a therapist, who is helped by one specific expert from an experts' pool. A sectoral approach is sometimes suggested to a group of similar companies, which will then exchange and share information, and adapt options. This approach allows for more specific worksheets and the extra financing module (e.g. loans, funds) is extremely useful.

COUNTRIES OF IMPLEMENTATION

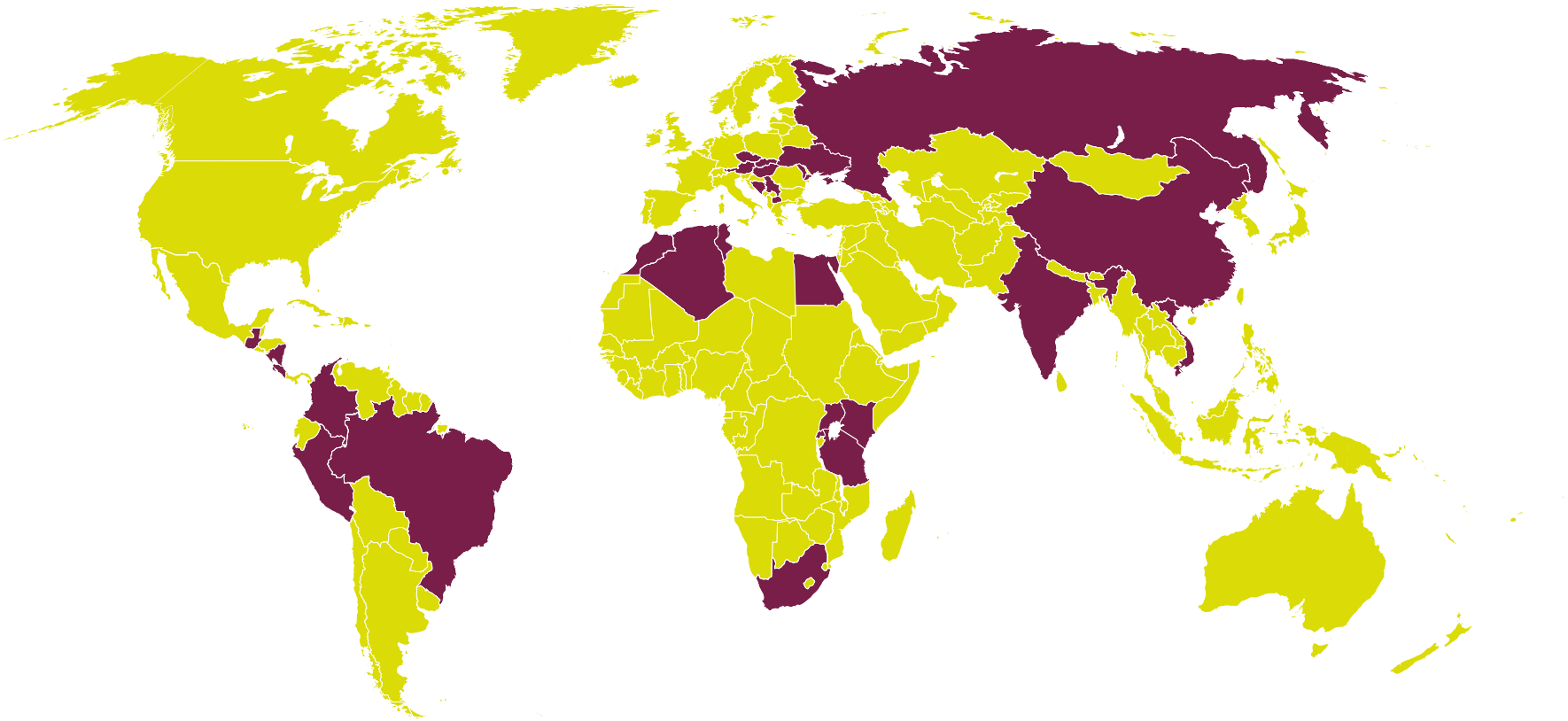


FIGURE 25: Countries in which the UNIDO RECP instrument has been implemented

Figure 25 shows the countries where the UNIDO RECP instrument has been implemented: Algeria, Austria, Bosnia, Brazil, China, Colombia, Costa Rica, Czech Republic, Egypt, Guatemala, Hungary, India, Kenya, Macedonia, Moldova, Morocco, Nicaragua, Peru, Russia, Rwanda, Serbia, Slovakia, South Africa, Tanzania, Tunisia, Uganda, Ukraine, and Vietnam.

USAGE SCENARIOS FOR THE INSTRUMENT

REQUIREMENTS

No specific requirements exist for the participating companies. Experienced consultants are recruited nationally and training courses for consultants have been held in several countries.

DURATION AND COSTS OF IMPLEMENTATION

- The **ToT** with the original training plan usually lasts 5 days. The work with a company and the final report takes another 3 days.
- **RECP Assessment:** work with a company, usually spread over 3 to 5 months
- **RECP Club (UNIDO model):** workshops and consultancy usually spread over up to 6 months

Table 15 shows the duration and assessment times involved in the implementation of RECP projects in Ukraine and Serbia.

SAVINGS

Documented savings cover a broad spectrum. Until 1999, a great number of full assessments was carried out. This approach was followed by a period during which UNIDO promoted a 'quick-scan' approach, which mostly consisted of a one-day, walk-through audit by an experienced consultant, plus the collecting of basic information and a follow-up by an experienced national consultant – so a broad range of cases exists, each with a different depth of analysis, company involvement and results.

From the experience of nearly 170 RECP assessments carried out by the Resource Efficient and Cleaner Production Centre in Ukraine, the average savings from identified measures showed to be ten times the average project cost.

Type of assessment	Duration	Assessment time	Result
Preliminary assessment	1 month	6 to 10 days	Presentation with an analysis of what can be achieved
Full assessment	4 months	40 days	Includes a detailed description of options

TABLE 15: Examples of assessment

EXAMPLES

The UNIDO RECP instrument was implemented in the EaPGreen project in Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. The project was implemented between 2014 and 2017 and aimed at moving towards a green economy by decoupling economic growth from environmental degradation and resource depletion. The RECP component of EaPGreen was funded by the EU (core funding), Austrian Development Bank, and other partners. The project was implemented through national service units and a national coordinator in each country.[37]

The implementation of EaPGreen RECP assessments showed significant economic and environmental savings in Armenia, Azerbaijan, Belarus, Georgia, Moldova and Ukraine. The average savings per company amounted to an average of € 2,000–€ 20,000, but some companies managed to save up to € 100,000. Overall, companies from the food processing, chemicals and construction materials sectors in Moldova saved € 1.45 million per year – and this was achieved using only the first set of feasible and low-cost RECP measures supported as part of the EaPGREEN project.[38]

→ MORE LINKS

37 https://www.unece.org/env/eia/about/eap_green.html ; http://www.oecd.org/fr/env/ouverture/eapgreen-objectives.htm ; https://www.unido.org/sites/default/files/files/2018-07/120143-EaP%20Green_Resource%20Efficient%20and%20CP%20component.pdf

38 http://www.green-economies-eap.org/media/eapgreen/documents/latest%20Project%20results.pdf

A SUMMARY OF THE UNIDO RECP INSTRUMENTS STRENGTHS AND WEAKNESSES

✓ STRENGTHS	– WEAKNESSES
The RECP Club model is especially effective. The club focuses on (quote) 'how to find weak areas' in a group of 8 to 10 companies during 6 common workshops and provides capacity building for them, based on a general vision. One round of problem-solving is carried out together, then the companies continue by themselves.	The challenge is to attract companies that may be exploiting grey zones and to involve SMEs in 'full' assessments. 30 days of external consulting also require the participation of the company concerned. The RECP Clubs require the participation of a company representative in the workshops during coaching and individual consulting.
RECP clubs generally create more involvement and continuity. When programme managers visit companies, they get to know the industry – and it also gives the general impression that the companies are working on a serious project. Excursions and visits usually support exchange and networking. Companies do not regularly attend other events.[39] Involving municipalities and other public institutions also helps.	One issue is the sustainability of activities in classic RECP assessments. For example, there are different opinions regarding continuation. In some countries, companies do not continue after the RECP assessment, while in others, only 50% continue. The classic RECP approach is ideal for a focused, one-off intervention for qualification-building processes in companies. Then continuation (e. g. within an Environmental and Energy Management System (EMS/ EnMS) or a club) would be helpful.
–	One drawback of the Club approach is that there is usually only a limited amount of specific technical input during the workshops. Technical experts should be included here – they could then visit the workshops and provide more detailed technical input for the topic in question. Measurements also have to be done frequently just to close the data gap. Action plans developed by company representatives on their own tend to be very basic, and expert input is also needed to formulate good action plans.

39 Set up: acquisition, first visit; 4–8 common workshops; 2–3 visits by experts; additional work with companies

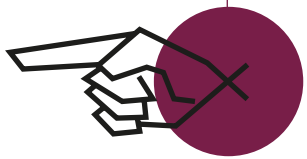
✓ STRENGTHS	– WEAKNESSES
–	The UNIDO methodology is a broad-based format, one which requires a lot of detailed information. There is a need for simple tools that have been adapted to the particular sector and specifically targeted through the experience of the consultants.

TABLE 16: Summary of the strengths and weaknesses of the UNIDO RECP instrument

2.2 Supporting Tools

The instruments of the second category can support those of the first by providing detailed tools and materials to support the work of intermediaries.

Overwiew



→ PRE-SME Toolkit

→ SIA Toolbox

→ GIZ Resource Efficiency Training Course

→ EREK

→ PRE-SME Toolkit

DESCRIPTION OF THE TOOL

Promoting Resource Efficiency in Small and Medium Enterprises (PRE-SME) is a user-friendly toolkit developed for UNEP and UNIDO in 2010. Intended for CEOs, operations managers, and cleaner production service providers, the tool (Resource Kit and Industrial Training Handbook) provides information about cleaner, resource-efficient production arranged by resource category (water, energy, chemicals, wastes and materials), and various achievement techniques.

The resources include:

- Guidelines for implementation
- A self-assessment tool to ascertain which areas need to be integrated
- An interactive representation of an industrial plant to aid users throughout their assessment (see Figure 27)
- Operational indicators
- Sector-specific benchmarks
- ToT resources
- A compendium of additional information (an Excel calculation tool to assess the efficiency of equipment, checklists, case studies, etc.)

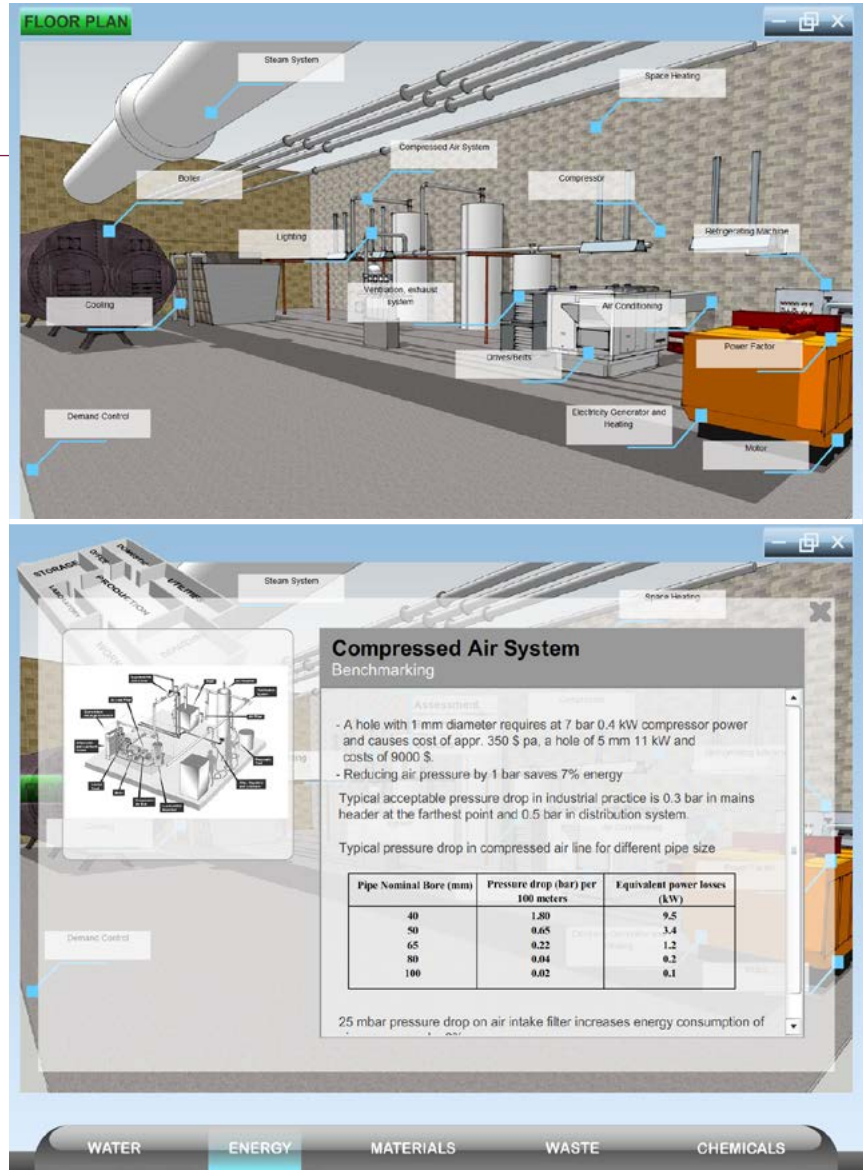


FIGURE 26: Examples for the interactive representation of an industrial plant

The supporting training handbook addresses:

- Resource efficiency, life-cycle thinking, dematerialisation, decarbonisation, the Plan-Do-Check-Act (PDCA) cycle, benchmarking, cleaner production, safer production and integrated management systems
- The PDCA cycle as a basis for continuous improvement
- Five thematic modules for detailed assessment (water, energy, materials, waste, chemicals)
- Benchmarking for different sectors and units
- Relevant international laws, restrictions and standards
- Guidance for planning a resource efficiency programme
- Slides for trainers, exercises for workshops, practical templates, Internet resources, etc.
- A selection of relevant manuals and studies

The PRE-SME Toolkit was designed to support training courses and provide SME newbies with a quick yet comprehensive introduction to all the relevant options, in an easy-to-grasp interactive format. Its main task is to support RECP training courses.

SUMMARY OF THE PRE-SME TOOLKIT

✓ STRENGTHS	– WEAKNESSES
Provides a very holistic overview of the resource efficiency and cleaner production topic and can be used in the basic and advanced training courses for companies. This applies especially to the 'virtual walk-through', to the interactive representation of a company with its organisational units and to typical hot spots to increase resource efficiency, assessment questions, benchmarks and options. This is a perfect tool for obtaining a quick overview of potential options and associating them with actual industrial plants.	The PRE-SME Toolkit was developed about 10 years ago. The virtual factory is a valuable tool for training purposes and for giving an overview of potential areas of intervention. The toolkit was technically realised using Adobe Flash which proved difficult to amend, with the result that it will be discontinued after 2020.
The toolkit can be used in all industries. Currently, it provides sector-specific checklists, benchmarks and options for twelve production sectors.	There are few results published regarding pilot implementations in Vietnam and Ethiopia, where the toolkit has clearly not been systematically introduced to the community of RECP centres.
An introduction to a systematic management approach (PDCA cycle (Plan-Do-Check-Act)) to support continuous application is included in the toolkit. Assessment activities and worksheets are assigned to the individual stages of the PDCA cycle.[40]	–

TABLE 17: A summary of the strengths and weaknesses of the PRE-SME Toolkit

40 The PDCA cycle is the high-level structure underlying international management system standards (ISO 9001, ISO 14001, ISO 50001, etc.)

→ SIA Toolbox

DESCRIPTION OF THE TOOL

The SIA (Sustainable Instrial Areas) Toolbox offers almost 300 tools, case studies, reports and a range of opportunities to improve the environmental performance of individual companies and industrial sectors. Each existing or newly planned individual area requires a specific mix of measures and tools, which can be selected in accordance with the project's priorities.

The SIA Toolbox is a compilation of these tools and expertise that is structured in three major phases and ten thematic subtopics. The three phases (introducing, designing and operating sustainable industrial areas) are not intended to reflect clearly definable and sequential stages, but to underline the various interventions necessary at different points in time when providing advice to administrative authorities, industrial park managers, planners and decision-makers at policy level. The toolbox is aimed at providing an overview of the expertise and services offered by GIZ in the field of sustainable industrial sectors and their entire life cycles. It also acts as a guide on how to use the developed tools for interested GIZ projects and their partner institutions.

SUMMARY OF THE SIA TOOLBOX

✓ STRENGTHS	– WEAKNESSES
Case studies – the descriptions of the instruments can be used during awareness-raising campaigns, direct work with individual companies and the implementation of eco-industrial parks.	Addresses intermediaries, not companies
The SIA Toolbox has a practical, simple search function to filter out the most relevant elements based on the request of the user.	

TABLE 18 summarises the strengths and weaknesses of the SIA Toolbox

→ GIZ Resource Efficiency Training Course

DESCRIPTION OF THE TOOL

The GIZ global project "Initiative Resource Efficiency and Climate Action" in cooperation with the German VDI-ZRE Center for Resource Efficiency developed a training course on resource efficiency for SMEs in emerging and developing countries. The course structure is based on the German VDI resource efficiency standard ("VDI 4801 directive on resource efficiency in small and medium-sized companies"), a voluntary standard for companies for the integration of resource efficiency in product design and production processes.

The course is originally designed as a train-the trainer format and consists of six modules. The modules are structured like a roadmap and can be either taught all together or individually ("modular kit"):
Module 1: Introduction and background – Resource efficiency in companies
Module 2: Roadmap „Resource Efficiency" – Method and approaches to resource efficiency in companies
Module 3: Analysis of the current situation in companies and application of tools
Module 4: Strategies and measures & examples of implemented measures
Module 5: Assessment of measures for resource efficiency
Module 6: Development of an individual training program for SMEs on resource efficiency

The training introduces instruments, methods and practical tools that can be used in companies to initiate, implement and evaluate material. It can further be used to analyse, implement and evaluate resource efficiency in product development and production processes, such as the use of cost accounting methods, corresponding guidelines, ISO standards and approaches for more efficient product design. The six modules are complemented by practical tasks, including exercises with online cost calculators, company checks to determine the status of resource efficiency fitness and good practice video case studies. The training is also suitable for self-learning.
The training is targeted at technical and environment-related consultants and experts in the field of resource efficiency in manufacturing companies, representatives of business associations, chambers, advisory or network organizations (multipliers) who deal with the promotion of sustainability in SMEs. The training is available in English, Spanish and Bahasa Indonesia.

SUMMARY OF THE GIZ RESOURCE EFFICIENCY TRAINING COURSE

✓ STRENGTHS	– WEAKNESSES
Experiences related by participants of training courses held in Argentina, Mexico and Indonesia show that the training was considered as a very structured introduction to the topic and the practical tools (cost calculator, company checks) were very well received.	–
–	Most of the examples were rated as being too high-level for the environment of the participants.

TABLE 19: A summary of the strengths and weaknesses of the GIZ Resource Efficiency Training Course

→ EREK

DESCRIPTION OF THE TOOL

The European Resource Efficiency Knowledge Centre (EREK) provides support for European companies, especially SMEs, save energy, material and water costs. One of the main products of the EREK is the RECP self-assessment tool. It guides companies through the RECP self-assessment process and helps them to better understand the issues related to the use of resources and the generation of waste and emissions. The tool also shows companies how to identify what causes inefficiency and losses and to generate options for improvement.

Six modules with practical assignments cover specific topics, such as the kind of information to collect, how to perform the quantitative and qualitative analysis, how to identify the reasons behind negative results and recognise and develop options for improvement. The tool is used by companies under the guidance of an RECP expert who provides coaching and keeps track of each company's progress in understanding the issues associated with the use of resources, in the generation of waste and emissions, in the identification of what causes inefficiencies and losses and in recognising options to improve.[41]

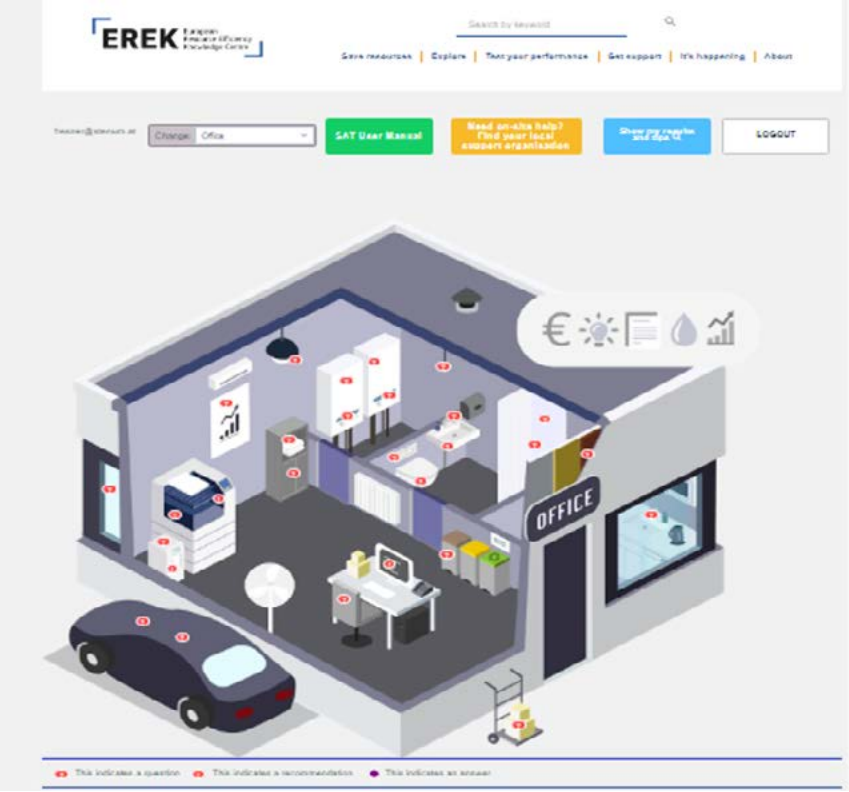


FIGURE 27: Screenshot of the virtual factory[42]

41 Source: https://www.resourceefficient.eu/en/support-programme/recp-self-assessment-tool
42 Source: https://www.resourceefficient.eu/en/erek-network

EREK was finalised in 2019 and transferred to the European Cluster initiative.

Success factors: Its broad outreach (media, website, events) as the biggest professional engineering association in German-language countries.

Savings: The VDI claims savings of up to 20 % of material costs (material costs amount to up to 40 % of the total costs of manufacturing companies in Germany).

SUMMARY OF THE EREK

✓ STRENGTHS	– WEAKNESSES
It was tested by several European SMEs. Their feedback? "The tool is good at providing an overview of RECP opportunities for a sector in just 30 minutes."	Lack of detailed information in the self-assessment tool.

TABLE 20: A summary of the strengths and weaknesses of the EREK

2.3 Results to be achieved with RECP instruments

RECP instruments targeting SMEs can have a significant impact. Returns on investment (ROIs) of 1:3 to 1:10 in comparison to the programme cost have been documented and these numbers have even been exceeded in some cases. Implemented options range from good housekeeping measures and organisational measures to technical upgrades, recycling and the installation of appropriate technology. Several cases have shown that companies get into the habit of continuing to apply the concept of RECP. This is supported by regional 'Club' approaches and the integration of RECP with standardised management systems.

The level of technical improvement can also be significant. This can be boosted by involving knowledgeable technical experts during the identification, planning and implementation of options. In instruments with self-assessment elements, the support of experienced external experts will lead to higher-quality action plans and higher implementation rates. Municipality-supported regional initiatives have the potential to support the municipalities in their enforcement of legal obligations to reduce environmental impact.

In the past, it was thought that increasing productivity meant getting the workforce to work faster or harder. However, it is increasingly being recognised that improving materials and resource productivity by using better machines, processes, technologies, product designs and working practices can create a significant increase in the efficiency of materials usage and a meaningful improvement in working time – for example, minimising waste and reworking tasks generates savings that have a real impact on productivity.

RECP does not conflict with labour market policies. However, synergies can be extremely specific. In a larger company, new positions can be created in environmental management, accounting, monitoring, controlling and training as part of the company's human resource development. In general, the employability of staff is improved by upgrading skills such as technical knowledge in terms of processes, chemicals, communication skills, analytical abilities and problem-solving.

3

HINTS AND RECOMMENDATIONS IN SETTING UP AND MANAGING RECP PROJECTS

3 Hints and recommendations in setting up and managing RECP projects

As we have seen in the first part, while there are numerous benefits of RECP for companies, economies and society, there are also important obstacles which prevent SMEs in developing countries from adopting RECP-oriented systems and management practices. In this final chapter we therefore mention a range of hints and recommendations for development professionals who want to set up and manage RECP projects. They have been collected through an in-depth review of the available literature, interviews with experts and projects staff working with RECP instruments and own experience of the authors.

PREPARATION PHASE

- **Assess the industries in your country/locality:** Start by assessing the main industries in the country/region you are operating in according to their environmental impact, economic relevance and performance and company sizes. If you are aware of the impact that specific industries have on the environment, it will help you identify the priorities for your project.
- **Be aware of relevant laws and regulations:** It is important to be aware not only of the relevant laws and regulations that support or hinder RECP, but also of whether they are being enforced and whether authorities are providing appropriate information about them.
- **Identify the needs of the target group:** Conduct interviews and focus-group discussions with companies to find out what is most important to them in terms of RECP – improving workplace conditions, solving actual environmental problems, fulfilling legal requirements, increasing productivity, etc.? Adapt your activities to meet the needs of your target group.

- **Partner with existing networks of experts:** Well-trained, experienced RECP consultants are essential for a successful implementation of the RECP programme. It is helpful to work with existing RECP centres and National Cleaner Production Centres. If there are no local RECP experts available, use international experts to deliver Training of Trainers. It's good practice to have an international expert host initial training courses and technical advisory sessions to train the local consultants. Subsequent training can then be hosted by the local consultants and mentored by the international experts.
- **Define a baseline and indicators to measure success:** A baseline and indicators will enable you to collect comparable outcome data for SMEs and to create a well-founded evaluation system for the project. Among the instruments presented, only the PRE-SME Toolkit includes this aspect in its setup.
- **Involve local stakeholders:** Actively involve and manage relevant stakeholders such as authorities, associations, chambers of commerce, universities, etc. (please refer to the relevant section on stakeholders below). This might include working with international buyers in global supply chains.

STAKEHOLDER MANAGEMENT

Stakeholders must be managed effectively if an RECP project is to succeed in a company. They are of primary importance especially during the kick-off phase of an RECP programme. While it is recommended to integrate as many stakeholders as possible into the approach, identifying and working with 'champions' – stakeholders who have a high level of influence and a high degree of interest and motivation in the programme – are key to the success of a programme.

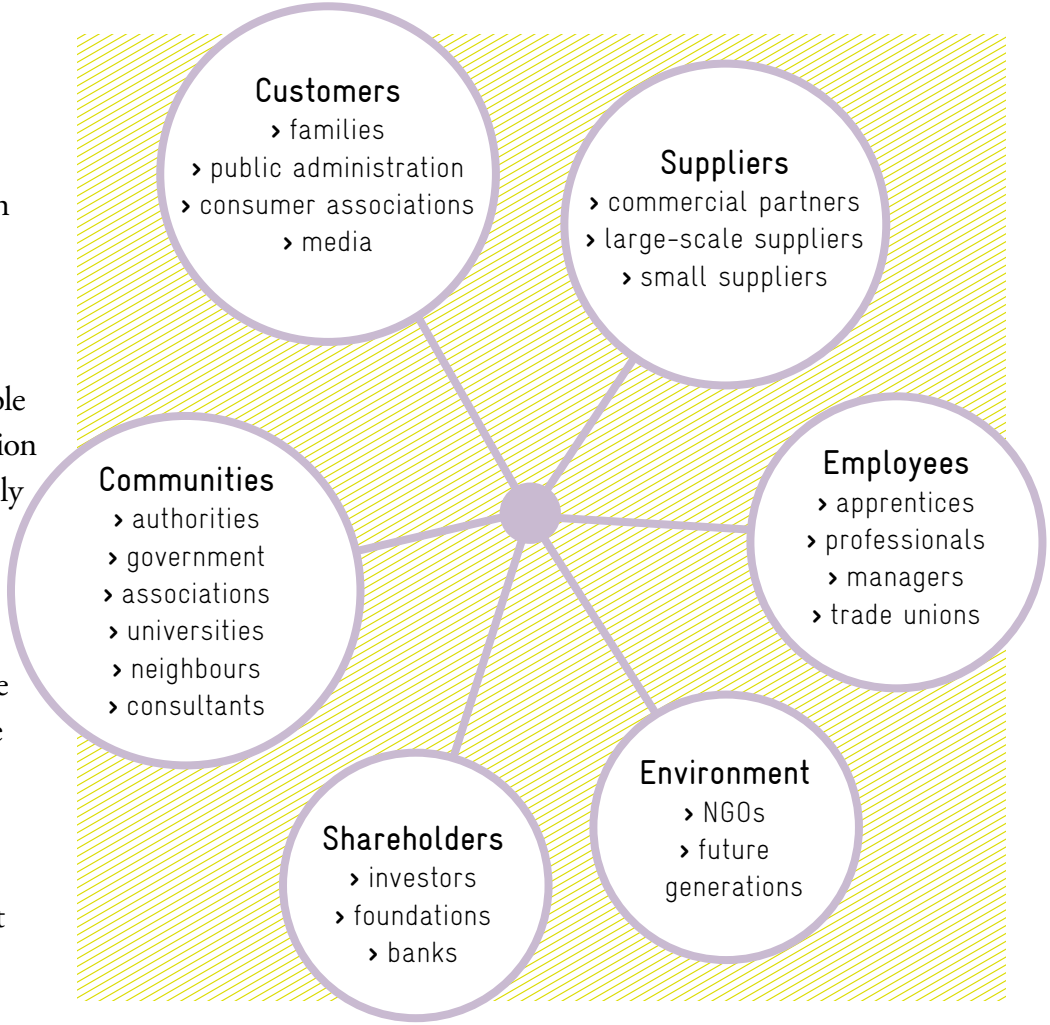


FIGURE 28: Potential stakeholders in an RECP instrument

IMPORTANT STAKEHOLDERS INCLUDE THE FOLLOWING GROUPS:

› **Authorities:** Authorities interact with companies in a variety of ways, as regulators, enforcers, and in administration, for example. They should be provided with relevant information on the programmes and their effects, so as to act as a foundation for informed decision-making and understanding. It is essential to address not only Ministry level staff, but to include all the staff working for the authorities.
The degree and the type of involvement of authorities in a region depend on the local conditions. When a programme is launched, the role the authorities play in a specific country must therefore be evaluated.

Potential examples of the involvement of authorities are:

- Advertising of programmes
- Support in identifying and motivating companies
- Initiation of training courses
- Funding
- Involvement in the formulation of individual projects

› **Experts:** There is a real demand for experts who can provide an in-depth assessment of practices and technology in the business and suggest options for improvement. It is very often the external consultants who provide the lion's share of the expertise that is essential for success of the RECP programme. The quality, especially of technical results, is enhanced by knowledgeable experienced external experts. In order to support companies during the implementation of RECP options and to support the continuation, a pool of national experts should be formed as a focal point and for knowledge exchange. National experts need to be identified and trained through a ToT programme. Potential sources for experts are companies, business service providers, authorities and educational institutions in the partner countries.
The ITC RECP programme and SCORE work in close cooperation with other organisations like UNIDO, using the capacity of the RECP network.

› **Champions:** Champions are perhaps the most important stakeholders. They bring life to the whole process and continually drive it onwards. There is plenty of evidence that every successful RECP initiative was driven by individual champions. There are two kinds of champions: internal (in companies or authorities) and external champions, who exist in most regions, so it's essential to increase the field of influence of these 'externals' in order to find more champions. Internal champions are already active in the field of CP (Cleaner Production) or they can be trained in its ins and outs – so mechanisms for locating and training champions like this are essential. Any of the participating expert organisations of the NCPCs (National Cleaner Production Centres) can also act as a champion. Internal

champions can often be located within the authorities and trained during a CP project. Networking and international contacts established at UNIDO meetings or within UNIDO networks with other NCPCs can also boost the performance of various stakeholders.

› **Other stakeholders:** Although all the above stakeholders are considered essential for the process, additional stakeholders must also be included. For example, the participation of chambers of commerce, labour organisations and NGOs can encourage a greater emphasis on societal change (new orientation), rather than simple reliance on better production regimes. However, the involvement of such stakeholders has been limited to date. In the city of Graz, Austria, the local chambers of commerce merely acted as facilitators rather than being actively involved. This is not necessarily a minor contribution of course – after all, it is a first step towards integrating them into the process. However, some companies and authorities are reluctant to get too closely involved with NGOs – and this is yet another area where awareness must be raised.

DESIGN AND IMPLEMENTATION

› **Flexibly combine the modules of instruments (customer orientation):** If elements from different instruments have the potential to increase the overall impact of a programme, adjust your activities accordingly (e. g. pre-assessment and workshops, benchmarking and workshops, etc.) – there is no harm in combining elements of different instruments. However: Don't overload training programmes with overambitious goals. Adapt the content to match the level of knowledge and the language of the companies.

› **Leverage network effects by facilitating communities** in which SMEs share information and motivate each other. Working together promotes mutual learning und activates swarm intelligence.[43]

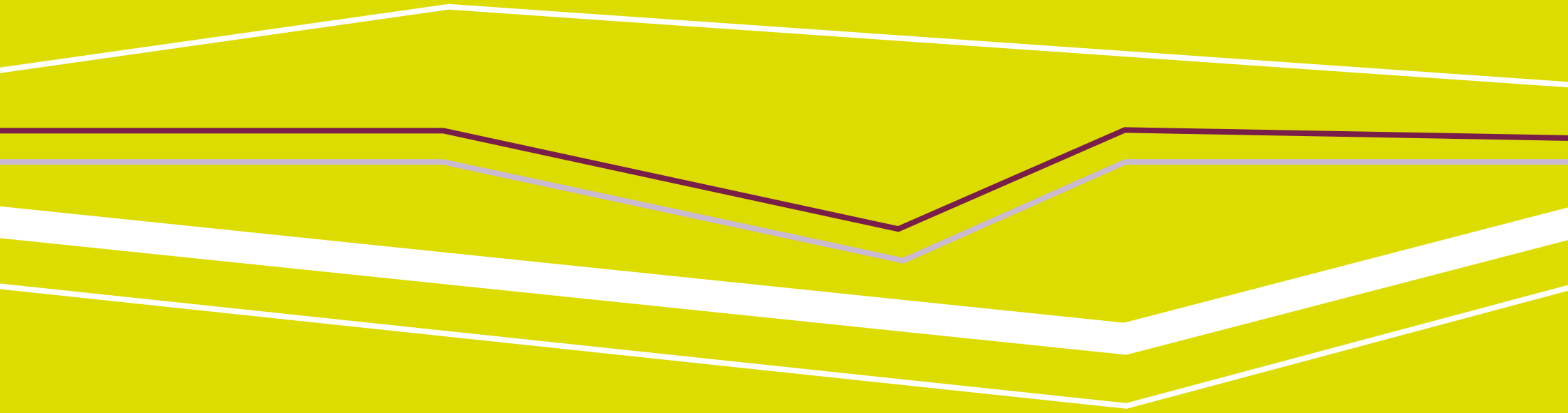
› **Offer access to finance support:** Involving financing institutions from the beginning helps to connect businesses early on to financing possibilities for their RECP measures. Feasibility analyses established at the beginning of a programme may serve as a basis for the companies to apply

43 https://www.argidius.com/wp-content/uploads/2019/04/Networking-Works-Report.pdf

for funding from banks and other institutions. Providing grants for implementing identified RE projects is another option to make companies more willing to commit their own funds.

- **Support data collection:** Design the data collection and analysis phase in such a way that it is finely balanced between self-assessment and external support. When companies collect data themselves it may promote awareness and ownership for the relevant RE figures and processes. External experts can provide guidance for data sources and undertake a plausibility check. Some companies may not be willing to provide data, because they fear bureaucratic consequences. In these cases, it is important to explain how the data will be used and why it is needed. Especially in companies with semi-informal accounting procedures, you may also encounter problems of data availability.
- **Be aware of the realities of the companies:** The day-to-day operations of SMEs are often beset by conflicting priorities and tight deadlines. They may also struggle due to a lack of data about technologies, funding opportunities and especially about up-to-date information on the local climate. When measures for more resource efficiency are identified, SMEs often only want to try the short-term measures, many of them have no desire to change their existing processes in the long term.
- **Communicate success stories of profitability:** SMEs have to be convinced that RECP interventions will be beneficial for them. Start by telling them success stories of increased efficiency and profitability. Success stories are available on the websites of the RECP centres, for example.
- **Facilitate "quick wins":** Experiencing the successful implementation of small measures (e. g. good housekeeping improvements) will motivate companies to continue with the programme.
- **Persuade the company management to buy into RECP:** For the training and implementation of identified measures to be successful, the management board must believe in RECP and give its approval. Mixed employee-management training can open the doors to full approval and subsequent workplace cooperation. At the same time, try to get the production, other management and accounting departments fully involved. The implementation of the instruments requires the long-term availability of an environmental team, which must be set up and established within the company.

4



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4 Listings

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List of abbreviations and acronyms

Appropriate technology	Technological choice and application that is small-scale, affordable by locals, decentralised, labour-intensive, energy-efficient, environmentally sound, and locally autonomous[44]
BAT	Best Available Technology
BMU	Bundesministerium für Umwelt, Naturschutz und nukleare Sicherheit
BREF	Best Available Technology Reference Guides
Carbon footprint	Carbon footprint[45]
CP	Cleaner Production
EaPGreen	Greening Economies in the Eastern Neighbourhood programme[46]
ECOPROFIT	ÖKOPROFIT Programme of the city of Graz
EMA	Environmental Management Accounting[47]
EMS	Environmental Management System
EnMS	Energy Management System
EREK	European Resource Efficiency Knowledge Centre
EST	Environmental Sound Technology[48]
EUR	Euro

44 Source: https://en.wikipedia.org/wiki/Appropriate_technology#:~:text=Appropriate%20technology%20is%20a%20movement,environmentally%20sound%2C%20and%20locally%20autonomous.

45 Source: https://en.wikipedia.org/wiki/Carbon_footprint

46 Greening Economies in the Eastern Neighbourhood (EaP GREEN) programme is a large regional programme implemented in 2013-2017 by the United Nations Economic Commission for Europe (ECE), OECD, UNEP, and UNIDO to assist the six European Union's Eastern Partnership (EaP) countries: Armenia, Azerbaijan, Belarus, Georgia, the Republic of Moldova and Ukraine, in their transition to green economy. The programme is financed by the European Commission

47 Source: https://www.un.org/esa/dsd/dsd_aofw_tec/tec_envimanaaccoinit.shtml

48 Source: https://www.unenvironment.org/regions/asia-and-pacific/regional-initiatives/supporting-resource-efficiency/environmentally-sound

Experience-based learning	Learning based on abstraction of concrete experience[49], using exercises, role plays, etc.
FDA	Federal Drug Administration
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
Good Housekeeping	Careful handling of raw materials, consumables, supplies, water and energy to avoid waste and emissions
HACCP	Hazard Analysis and Critical Control Points
ILO	International Labour Organisation
ISO	International Standardisation Organisation
ISO 14001	International Standard for Environmental Management Systems
ISO 50001	International Standard for Energy Management Systems
ITC	International Trade Centre[50]
Kaizen	Change process[51]
kWh	Kilowatt-hour
Lean production	Original method to optimise production factors[52], also applied to service providers
MFCA	Material Flow Cost Accounting
NPO	Non-Productive Output
NPV	Net Present Value
OD	Organisational Development[53]

49 Source: https://en.wikipedia.org/wiki/Experiential_learning
50 An agency of the United Nations and the World Trade Organisation
51 Source: https://en.wikipedia.org/wiki/Kaizen
52 Source: https://refa.de/service/refa-lexikon/lean-production
53 Source: https://de.wikipedia.org/wiki/Organisationsentwicklung#:~:text=Organisationsentwicklung%20(OE%3B%20englisch%20organization%20development,sozialen%20Wandel%20in%20Organisationen%20umzusetzen.

p. a.	Per annum, per year
PDCA	Plan-Do-Check-Act cycle or Deming-wheel[54]
PREMA	Profitable, Resource-Efficient Management
PREPARE	Preventative Environmental Protection Approach in Europe[55]
PRE-SME	Preparing SME for RE
RE	Resource Efficiency
RECP	Resource-Efficient and Cleaner Production
RECPA	Resource-efficient and Cleaner Production Assessment
RECPnet	RECP Network of UNIDO[56]
SCORE	Sustaining Competitive and Responsible Enterprises
SIA	Sustainable Industrial Areas
SME	Small and Medium-Sized Enterprises
TEST	Transfer of Environmental Sound Technology
TOC	Theory of Constraints
ToT	Training of Trainers programme
UNEP	United Nations Environment Programme
UNIDO	United Nations Industrial Development Organisation
US EPA	US Environment Protection Agency
USD	US Dollar

54 Source: https://www.jica.go.jp/english/our_work/thematic_issues/health/c8h0vm00009u4yt7-att/text_en_03.pdf

55 Source: Preventative Environmental Protection Approach in Europe) is a pollution prevention initiative under the EUREKA umbrella. In Austria, the project was carried out on behalf of the Ministries of Science and Environment from 1991 to 1994.

56 Source: https://www.recpnet.org/

5

ANNEX:
INTERVIEW EVALUATIONS & LINKS

5.1 Evaluation of the instruments from the perspective of the interviewees

THE EVALUATION OF SCORE FROM THE PERSPECTIVE OF THE TWO INTERVIEWEES

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can be used for improving resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			The instrument can be used in companies with a relevant material, energy or water flow. This can apply to SMEs and to larger companies. The instrument focuses on the processes at company level. Depending on the process, the aspects of circular economy can be addressed, as can the development of options.
Service/instrument can be used in several sectors and/or is modularly extendable.	x			The methodology can be applied in every industrial sector. International experts will be selected and employed to match the needs of the company and to guide the assessment and the identification of sector-specific improvement options.
Service/instruments are used in several projects (+3) and information on the instrument's individual impacts is available.	x			The instrument was developed within the DANUBE programme 2003 and continuously developed within the framework of the SWITCHMed programme of the European Union.

				It was implemented in the following sectors: › Chemical and pharmaceutical (23 companies) › Food and beverage (147 companies) › Leather (13 companies) › Metal, electrical and motor vehicle parts (19 companies) › Paper, printing and plastic products (11 companies) › Textile and garments (18 companies).
Service/instrument has the potential to systematically enhance productivity and profitability for companies.				The focus is on resource productivity, reduced operational costs, improved product quality, optimised investments, improvement of the relationship with stakeholders and new business opportunities.
Service/instrument has the potential to systematically enhance productivity and profitability for companies.	x			The methodology prepares the implementation of an environmental management system at company level. The implementation of a communication and a 'needs-driven' monitoring system is part of the methodology and indicators are established. The definition of a clear baseline is part of the work with the companies. In the first part of the programme, an information system is prepared. During the second part, expert advice on technical topics for priority areas is given.

TABLE 21: An evaluation of SCORE according to the selection criteria

THE EVALUATION OF THE TEST INSTRUMENT FROM THE PERSPECTIVE OF THE TWO INTERVIEWEES.

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can improve resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			The instrument can be used in companies with a relevant material, energy or water flow. This can apply to SMEs and to larger companies.
The instrument focuses on the processes at company level. Depending on the process, the aspects of circular economy can be addressed, as can the development of options.	x			The methodology can be applied in every industrial sector. International experts will be selected and employed to match the needs of the company and to guide the assessment and the identification of sector-specific improvement options.
Service/instrument can be used in several sectors and/or is modularly extendable.	x			The methodology can be applied in every industrial sector. International experts will be selected and employed to match the needs of the company and to guide the assessment and the identification of sector-specific improvement options.
Service/instrument has the potential to systematically enhance productivity and profitability for companies.				The focus is on resource productivity, reduced operational costs, improved product quality,

Service/instrument provides a targeted sequence of activities and initiates a continuous improvement cycle.	x			The methodology prepares the implementation of an environmental management system at company level. The implementation of a communication and a 'needs-driven' monitoring system is part of the methodology and indicators are established. The definition of a clear baseline is part of the work with the companies. In the first part of the programme, an information system is prepared. During the second part, expert advice on technical topics for priority areas is given.

TABLE 22: An evaluation of the TEST instrument according to the selection criteria

THE EVALUATION OF THE ITC RECP INSTRUMENT FROM THE PERSPECTIVE OF THE INTERVIEWEE

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can improve resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			The instrument addresses SMEs in the international value chains. The goal is the reduction of the consumption of resources used in the production processes.

Service/instrument can be used in several sectors and/or is modularly extendable.	x			The instrument has been implemented in the clothing, tea and coffee sectors. Documented case studies for other sectors are not yet available. We assume that the approach is not limited to the already documented sectors, since (technical) sector experts will be used during the coaching phase of the programme.
Service/instruments are used in several projects (+3) and information on impacts is available.		x		The instrument has been implemented in Egypt, Jordan, Morocco, Tunisia, Ghana, Kenya, Peru, Vietnam, Burundi, Kenya, Tanzania, Uganda and Ethiopia. Information on the savings achieved and the impacts of the instrument is not yet available.
Service/instrument has the potential to systematically enhance productivity and profitability for companies.		x		Increases the international competitiveness of value chain players through reduced production costs and increased productivity.
Service/instrument provides a targeted sequence of activities and initiates a continuous improvement cycle.		x		The method shows no explicit focus on the implementation of the PDCA cycle.

TABLE 23: An evaluation of the ITC RECP instrument according to the selection criteria

THE EVALUATION OF THE ECOPROFIT INSTRUMENT FROM THE PERSPECTIVE OF THE INTERVIEWEE

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can be used for improving resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			Has been demonstrated in Colombia, Korea, India, China, etc.
Service/instrument can be used in several sectors and/or is modularly extendable.	x			Workshop structure is element-oriented (introduction to RECP and input/output, policy and team, material flow analysis, energy analysis, monitoring, controlling, purchasing) and media-oriented (chemicals, water, energy, materials), so it basically covers all industries; modifications for metal manufacturing and hospitality exist, as do modules and elements for workshops targeting a variety of sectors. A targeted version for micro-enterprises has also been designed.
Service/instruments are used in several projects (+3) and information on impacts is available.	x			Several databases exist (Austria, Germany, documentation in India), in Colombia, Nicaragua, South Africa, Uganda, India, China, Korea, Germany, Slovenia, Hungary and Austria and in the modified RECP Club version in Belarus, Ukraine, Moldova, Armenia, Georgia.
Service/instrument has potential to systematically enhance productivity and profitability for companies.		x		Yes – the extent to which processes are altered, etc., depends on the implementing consultant.

Service/instrument provides a targeted sequence of activities and initiates a continuous improvement cycle.	x	x		The method shows no explicit focus on the implementation of the PDCA cycle.

TABLE 24: An evaluation of the ECOPROFIT instrument according to the selection criteria

THE EVALUATION OF THE PREMA INSTRUMENT FROM THE PERSPECTIVE OF THE INTERVIEWEES

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can be used to improve resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			PREMA is designed for micro-enterprises, SMEs, service providers, and TVET schools. 2,500 people have been trained.
Service/instrument can be used in several sectors and/or is modularly extendable.	x			Classic structure: workshops on profitable resource management, cost assessment, etc. Range of material and energy flows is from door-to-door, but has lately been expanded to include sourcing and LCA.
Service/instruments are used in several projects (+3) and information on impacts is available.	x			There are well-documented case studies. However, it has been observed that people are very slow when it comes to documenting progress.

				Has been used in Algeria, Peru, Tunisia, Morocco, Mexico, China, Thailand, Croatia, Zimbabwe, Pakistan, Palestine, Armenia, Chile, Armenia in all the sectors. However, it does not work when the materials are cheap, and local experts must be brought for their technical know-how.
Service/instrument has the potential to systematically enhance productivity and profitability for companies.		x		No explicit focus on increasing productivity and profitability.
Service/instrument provides a targeted sequence of activities and initiates a continuous improvement cycle.	x			3 actions are implemented per company and an action plan is defined; companies continue for 1-2 years, depending on the country and the national experts.

TABLE 25: An evaluation of the PREMA instrument according to the selection criteria

THE EVALUATION OF THE UNIDO RECP PROGRAMME FROM THE PERSPECTIVE OF THE INTERVIEWEES

CRITERIA	VERY APPLICABLE	LESS APPLICABLE	NOT APPLICABLE	EXPLANATION/REMARK
Services & instruments can be used for improving resource efficiency and/or circular production in (M)SME in developing and emerging countries.	x			The approach can be used in SMEs in general and in developing countries. It can also make capacity building feasible and generate RECP options.

Service/instrument can be used in several sectors and/or is modularly extendable.	x			The model can be easily adapted to sectors with a specific focus (garments: light and small machines; food, water and chemicals, etc.). The general approach is the same. The RECP practitioner resembles a therapist, who is helped by a specialist from a pool of experts. A sectoral approach is occasionally suggested with a group of similar companies, which will then exchange and share information, etc., and adapt options. This approach enables the creation of more specific worksheets; the extra financing module is very good (loans, funds, ...).
Service/instruments are used in several projects (+3) and information on impacts is available.	x			Many business cases exist. Information can be acquired from: › contact with the regional RECP centre of the RECP network › contact with UNIDO › consulting project webpages › corresponding ministries of the economy and/or the environment. Good personal contact is important for evaluation, since the programme design does not obligate monitoring by participants.
Service/instrument has the potential to systematically enhance productivity and profitability for companies.				There is potential for a general increase of productivity, for building on environment and health safety aspects and integration into lean management.[57]

57 An example: By calculating the ideal energy consumption of a brick plant, it was shown that the plant was not performing at its best. A new manager used the results of the audit and increased production by 50%–100%, with the same energy consumption These and other experiences are used in teaching. It is sometimes difficult to publish results like this due to confidentiality issues.

Service/instrument provides a targeted sequence of activities and initiates a continuous improvement cycle.	x	In larger companies, there is evidence that they continued with the programme and continuously initiated changes. Some SMEs liked the concept, but did not really appreciate the rigorous and systematic continuation of the programme. However, when they had completed the programme, they realised they had become more aware of the cost of water, energy and pollution. Some companies continued actively for years.

TABLE 26: An evaluation of the UNIDO RECP instrument according to the selection criteria

5.2 Cost of the instruments

Table 27 shows the data collected during the interviews regarding the cost of the implementation of the instrument and the resulting benefits (ratio of cost per company to savings).

INSTRUMENT	COST FOR A COMPANY	BENEFIT
ECOPROFIT →	€1,000 (India + cost for an external expert, covered by GIZ), mostly national	1:10 (India)
PREMA →		1: 3 (overall)
SCORE →	€2,000 per module per company	1:5
UNIDO RECP →	€1,500 (national experts, Ukraine, €250 to €300/month salary), less for the RECP Club	Wide range depending on sector, energy and material flows, in 2017 on average €25,000 per company (Ukraine)
TEST →	€100,000 EUR per company (based on the published project budget and the companies involved)	1:3.5
GIZ Resource Efficiency Training Course →	€100,000 EUR for 3*3 days	
PRE-SME Toolkit →	No information provided	Was designed as targeted support for a working method (PDCA) and showed technical aspects for beginners
SIA Toolbox →		Knowledge management system, data base

Note: needs further in-depth analysis

TABLE 27: Data on the costs and the benefits of the instruments

5.3 Links with further information

INSTRUMENT	FURTHER INFORMATION & AVAILABLE SUPPORT MATERIAL
SCORE (ILO) →	The SCORE Programme (ENTERPRISES) (ilo.org) Case studies Global SCORE Team
TEST →	Test website The TEST Tool kit consists of › a guideline document; › A set of tools (MFCA Excel file and manual, energy mapping tool, checklists, etc.), › set of training materials (ppt, exercises, case studies), Best practice catalogues, more than 250 best practice examples saved from
ITC RECP →	Supporting materials are available upon request The ITC provides additional online RECP training for SMEs. The training is hosted by ITC's SME Trade Academy.
ECOPROFIT →	20 years ECOPROFIT Germany 1998–2018, Summary of results Supporting materials are available upon request Downloads of presentation, posters, etc. are available on the SIA Toolbox
PREMA →	https://www.premanet.net/ Information via the SIA Toolbox Supporting materials are available upon request

UNIDO RECP →	www.recpnet.org Introduction to Cleaner Production: Guidebook › Checklist › Eco-design example; › Eco-design › examples; › Exercises; › Questions; › Slides; › Teachers' notes; › Textbook; › Worksheets
GIZ Resource Efficiency Training Course →	https://www.resource-germany.com/tools/ List of available tools
EREK →	Self-assessment tool for different sectors
PRE-SME →	Worksheets and sector-specific checklists are included in the PRE-SME Resource Kit.

TABLE 28: Links with further information for each instrument/tool

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