D4.1: Report on GreenEcoNet "Toolbox" and guidelines

Contents

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PROJECT PARTNERS

DISCLAIMER

Executive summary

Among the objectives of the GreenEcoNet project, there is the willingness to provide improved decision-making support to the users of the web-platform, such as corporate decision-makers, planners, analysts, policy-makers, and interested general audience, from both EU and non-EU countries.

To this purpose, one of the activities of the project is to collect and share decision support systems for green economy analysis, planning, and implementation to public and private stakeholders in both EU and non-EU countries. The outcome will be a green economy toolbox, which will be an active section of the web-platform throughout the lifespan of the project. In this document we provide an initial overview of tools currently available in the diagnosis, analysis, planning, and implementation in green business development. This is a living document with additional tools to be added once case studies are being added to the platform. The current document contains a template for tool description, illustrative examples of tools, and guidance in terms of how and when to use the tools. We, therefore, invite the reader to access the GreenEcoNet platform to access the latest version of the toolbox.

Introduction

This report contains an overview of tools that are applicable for supporting green business initiatives by Small and Medium sized Enterprises (SMEs). The overview is based on inputs from the GreenEcoNet partners about tools that they have developed or used in their own research and/or policy and decision-making consultancy, or that they have otherwise become familiar with. The tools have been described with help of a standardised template, which enables a uniform characterisation and comparison of tools, as well as an efficient presentation of the tools on the GreenEcoNet platform.

The tools have been selected and described for the following stages in green business development:

1. **Diagnosis**: these tools support SMEs in identifying the state-of-play with their business in terms of, for example, balanced economic, social and environmental performance, ecological footprint, or energy use profile determination, as well as identifying aspects for improvement;
2. **Analysis**: these tools help SMS to explore possible options for greening business, familiarise themselves with these options, and assess the options in terms of benefits and costs;
3. **Planning**: SMEs can use the tools in this category to identify market barriers to implementation of the selected green business options (such as conflicting legislation, misaligned incentives, value chain inefficiencies, competition and insufficient supporting services) as well as enabling actions to solve these barriers. In this category are also tools to support formulation of business plans with funding and revenue plans by SMEs;
4. **Implementation**: The planning tools support a smooth implementation of the green business options by SMEs, but the implementation stage itself requires tools for maintenance of the green business technique or technology, and for a proper monitoring and evaluation of green business performance.

In addition to application to **SME greening of business**, some of the tools can also be used by **policy makers** for identifying and implementing green economy options at the national, local or sector-level (such as participatory multi criteria development criteria and market mapping for identification of barriers and enablers for green economic options), while a few other tools identified could also be used by the **general public** to explore their possible actions towards green consumption patterns (e.g. ecological footprints).

The following section contains descriptions of all the tools collected by GreenEcoNet partners.

List of tools

The following list gives an overview of the initial list of tools included in the GreenEcoNet toolbox. The list is sorted alphabetically and indicates for every tool in which stage of the 'greening' of SMEs the tool is to be used.

Table 1. List of tools included in the GreenEcoNet toolkit.

#	Tool name	Diagnosis	Analysis	Planning	Implementation
1	BalticClimate toolkit			●	
2	Carbon footprint	●	●	●	
3	Cost-benefit analysis (CBA)		●		
4	Ecotoolkit	●	●		●
5	EUREAPA (policy assessment tool)	●	●		
6	Green Office Checklist	●			
7	Green Office Handbook		●	●	
8	i-CARE	●	●		
9	IPAT-S			●	
10	LEAP		●	●	
11	Life Cycle Assessment	●	●	●	
12	Market and system mapping		●	●	
13	Material Input Per Service unit (MIPS)	●		●	
14	MOVE-IT!	●			●
15	PESTLE-SWOT Analysis	●	●		
16	Porter's Five Forces Tool		●	●	

The following sections introduce each of the above-mentioned tools. The tools collected have been described under the following headings:

- Description and background of the tool
- Applicability of the tool
- Process of tool application
- Benefits of the tool
- Examples of tool application
- References

During the implementation of the project, this list of tools will be further expanded, and the updated toolbox made available in the web-platform. It is, therefore, strongly suggested to visit the area to the toolbox in the GreenEcoNet platform.

1. BalticClimate

Full tool name:	BalticClimate toolkit
Author:	Baltic Sea Region Programme
Purpose:	Project and business planning

Description

The BalticClimate Toolkit provides local and regional level policy makers, spatial planners, and the business community with climate mitigation and adaptation support. Development and increased competitiveness of municipalities, regions and companies are the main objectives.

Development was done within the BalticClimate project, part-funded by the European Union's Baltic Sea Region Programme 2007-2013.

Applicability

The BalticClimate toolkit supports the development of a company and assists to increase the competitiveness. The toolkit assesses how climate change will affect transport, housing, energy, and agriculture in a region, and what opportunities new conditions and situations will provide.

Process of tool application

The Climate SWOT analysis (strengths, weaknesses, opportunities and threats) is constructed in four phases: (1) Identification of product life cycle stages, (2) Identification of climate impacts now and in the future, (3) Significance assessment of the climate impacts, and (4) Compilation of the Climate SWOT.

The required resources for implementation of the Climate SWOT analysis of the BalticClimate toolkit include economic resources to fund a person/team to identify the product LCA, climate impacts information, to undertake the assessment of significance of climate impacts, and for the compilation of the Climate SWOT.

Benefits

The value of sustainability can be materialized in various ways:

- When the focus of sustainability is on regulatory compliance, the main value is derived through protection of the license to operate on the market (e.g. meeting the climate targets set in the EU climate policy).
- Considering sustainability aspects of businesses, it can help to identify potential risks of operations. Therefore, sustainability assessment can be a valuable support for risk management. Prevention of climate related risks reduce costs of emergency response, product liability costs, and insurance premiums (e.g. investments in walls and barriers to prevent damage caused by floods resulted from increasing temperature and precipitation).
- Focusing on operational efficiency often contributes to both cost reductions and improvement of eco-efficiency. Economic benefits are achieved through increased productivity, more efficient resource use, minimization of waste, and sustainable design of investments (improvements in energy efficiency, e.g. energy saving services).

- A typical way to create value from sustainability is to increase competitiveness through image improvement. By safeguarding corporate image and brand, customer loyalty can be improved (e.g. cooperation with NGOs).
- Enhancing sustainability attributes of products throughout the value chain can be a source for market growth (e.g. carbon footprints for products).
- Monitoring and managing strategic sustainability issues in society can be a driving force for innovations leading to redirection or redefinition of existing business concepts. Consequently, new sustainable markets can be developed based on new product or service concepts (e.g. car sharing).
- The value of sustainability can also be observed as improved staff motivation. This can be an extremely important issue in countries with an aging population, which will be forced to compete for qualified and motivated work force in the near future. Sustainable corporate culture can create more attraction on employment markets.

Examples
Examples of the implementation of the toolkit can be found at http://www.toolkit.balticclimate.org/en/examples.

References
http://toolkit.balticclimate.org/

2. Carbon footprint

Full tool name:	Carbon footprint
Author:	Initially Wackernagel & Rees (1996)
Purpose:	Diagnosis, analysis, planning

Description
The carbon footprint indicates the overall amount of carbon dioxide (CO_2) and other greenhouse gas (GHG) emissions associated with a product, along its supply-chain and sometimes including from use and end-of-life recovery and disposal. There are three main types: organisational carbon footprint, value chain carbon footprint, and product carbon footprint.

Wackernagel and Rees (1996) define an "ecological footprint" as an accounting tool used to measure the resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area. The term "carbon footprint" originated from the ecological footprint concept but in recent years has evolved into a concept in its own right.

Applicability
The carbon footprint method allows SMEs to identify where the key carbon hot spots are within their product's life cycle. Subsequently, it helps SMEs to develop low-carbon products and services and to choose green business options. In that way the carbon footprint method allows SMEs to differentiate their products based on measured environmental characteristics.

Process of tool application

There are many available sources of data, software tools, consulting services, handbooks, and technical guidance on life cycle assessment and the climate change impacts from goods and services, either for a fee or free of charge. The LCA Resources Directory for identifying such sources (in Europe and beyond) is available at http://lca.jrc.ec.europa.eu/lcainfohub/.

Suitable background data sources for the footprint are those available in existing LCA databases. These databases contain the life cycle profiles of the goods and services, as well as of many of the underlying materials, energy sources, transport and other services.

Benefits

The carbon footprint method provides better information about environmental performance of products, which can also be used for marketing purposes. A benefit could be the avoidance of direct or indirect costs of CO_2 emissions (e.g. through an emissions trading system).

Examples

Carbon footprints have been calculated for a large number of products and services, including: Cement, paper, plastic, glass, cans, computers, carpet, tires, lumber and other building materials, paved roads, mailing letters and packages, foods, shirts, detergents and many more.

References

- European Commission, JRC (2007): Carbon Footprint – what it is and how to measure it, Ispra. http://lct.jrc.ec.europa.eu/pdf-directory/Carbon-footprint.pdf
- European Commission, JRC (2009): Making sustainable consumption and production a reality – A guide for business and policy makers to Life Cycle Thinking and Assessment, Luxembourg. http://lct.jrc.ec.europa.eu/pdf-directory/Making%20sustainable%20consumption%20and%20production%20a%20reality-A%20guide%20for%20business%20and%20policy%20makers%20to%20Life%20Cycle%20Thinking%20and%20Assessment.pdf
- Growcom, A. (2008): What is a Carbon Footprint? An overview of definitions and methodologies, Horticulture Australia Ltd, Sydney. http://www.daff.qld.gov.au/__data/assets/pdf_file/0003/59025/Hort-Fruit-Drought-Carbon-Report1.pdf
- Wackernagel, Mathis & Rees, William (1996)"Our Ecological Footprint" (New Society Press)

3. Cost-Benefit Analysis

Full tool name	Cost-Benefit Analysis (CBA)
Author	
Purpose	Analysis

Description

Cost-Benefit Analysis (CBA) is a technique that compares the monetary value of benefits with the monetary value of costs in order to evaluate and prioritize issues. The effect of time (i.e. the time it takes for the benefits of a change to repay its costs) is taken into

consideration by calculating a payback period. In its simple form, CBA uses only financial costs and financial benefits (e.g. a simple CBA of a road scheme would measure the cost of building the road, and subtract this from the economic benefit of improving transport links). A more sophisticated CBA approach attempts to put a financial value on intangible costs and benefits (e.g. the cost of environmental damage or the benefit of quicker and easier travel to work) through measuring WTP ('willingness to pay' for an environmental gain) and WTA ('willingness to accept' compensation for an environmental loss).

Applicability

CBA is the social appraisal of marginal investment projects, and policies, which have consequences over time.It uses criteria derived from welfare economics, rather than commercial criteria. CBA seeks to correct project appraisal for market failure. Environmental impacts of projects/policies are frequently externalities, both negative and positive CBA seeks to attach monetary values to external effects so that they can be taken account of along with the effects on ordinary inputs and outputs to the project/policy.

Process of tool application

- Identify all costs and benefits
- Measure them
- Discount them back to common time period
- Assess whether benefits>costs
- Assess who bears the benefits and costs
- Perform sensitivity analysis
- Assess whether proposal is worth it

You can carry out a Cost-Benefit Analysis using only financial costs and benefits. However, you may decide to include intangible items within the analysis. As you must estimate a value for these items, this inevitably brings more subjectivity into the process.

Benefits

Some examples of the types of business decisions that may be facilitated by cost-benefit analysis include whether or not to add employees, introduce a new technology, purchase equipment, change vendors, implement new procedures, and remodel or relocate facilities. In evaluating such opportunities, managers can justify their decisions by applying cost-benefit analysis. This type of analysis can identify the hard dollar savings (actual, quantitative savings), soft dollar savings (less tangible, qualitative savings, as in management time or facility space), and cost avoidance (the elimination of a future cost, like overtime or equipment leasing) associated with the opportunity.

Examples

n/a.

References

http://www.mindtools.com/pages/article/newTED_08.htm

4. Ecotoolkit

Full tool name	Ecotoolkit: Ecoscan, Ecomapping and Ecotips
Author	The Ecotips 2.0 Team
Purpose	Diagnosis, Options, Implementation

Description

The Ecotoolkit comprises three environmental management tools, which a company may use in order to get an understanding of its current environmental situation and main problems, manage and reduce its environmental impact, and respectively improve its environmental performance. These three tools can be seen as the elements of a simple environmental management system.

Ecoscan is an online carbon and ecological footprint calculator for small businesses in eight economic sectors: hotels, bars and restaurants, offices, hair dressers, car repair shops, home improvements, events, and retail shops.

Ecomapping is a visual and practical tool that helps small businesses to analyse and manage their environmental behaviour.

Ecotips is a multisectoral database of environmental and economic tips for small and medium enterprises.

Figure 1. The three environmental management tools of the Ecotoolkit.

Applicability

The Ecoscan contributes towards efficiency of resource use. The Ecomapping tool helps small companies to implement environmental management, ISO 14001 and EMAS. This

visual and practical tool helps SME managers and employees to analyse and manage the environmental performance of small companies and craft industries. The Ecotips tool provides key advice to a company manager on specific measures for the environmental aspects and problems, which have been identified by using Ecomapping and Ecoscan. Ecotips provides also information on relevant legislation and potential cost savings, which may result after specific measures are taken.

Process of tool application

For the Ecoscan, the user enters into the prescribed boxes the relevant information about energy and water consumption, waste generation, mobility, purchasing, etc. The information can be entered for single occasions, or annually. Then the user can visualise and compare its carbon or ecological footprint over time, per environmental aspect. It is highly advisable, after the three steps have been undertaken (in a given period of time, e.g. 6 months or 1 year) to use the Ecoscan again, in order to assess the changes in environmental performance.

As 80% of the environmental problems are related to a specific location, Ecomapping the organisation's workshops and offices is very useful to show clearly which environmental nuisance occurs and where. For Ecomapping you will need a detailed floor plan of the office or workshop, and less than one hour for each ecomap. More information about the process of ecomapping is available at the website http://www.ecotoolkit.eu/ecomapping.php.

For Ecotips, users need to choose their sector. Subsequently, they will receive an overview of activities that may have environmental impacts in their sector. Finally, advices are given in relation to the selected activity, including the impact they might have on the environment, any potential financial return there might be and other relevant information.

Benefits

The Ecoscan provides a simplified environmental calculator aiming at giving a first estimation of the carbon and ecological footprint of a small organisation.

The Ecomapping module provides guidance for the users on how to carry out an on-site environmental review to identify and analyse the main environmental aspects/problems related to energy use, water use, air emissions, waste, noise, purchasing, stakeholders, etc. This tool also enables a company manager to develop a light informal action plan for environmental improvements in the problematic areas of his or her company's operations.

The Ecotips tool provides to a company manager key advice on specific measures for the environmental aspects and problems, which have been identified by using Ecomapping and Ecoscan. Ecotips provides also information on relevant legislation and potential cost savings, which may result after specific measures are taken.

Examples

The tools of the Ecotoolkit are used by SMEs worldwide in various sectors. When using the Ecotips tool, examples of best practices are provided together with the advice.

References

Ecomapping has been developed by Heinz Werner Engel in the context of the INEM project, EMAS Tool Kit for SMEs in 1998. All information is to be found on http://www.ecotoolkit.eu.

5. EUREAPA

Full tool name	EUREAPA Scenario Modelling and Policy Assessment Tool
Author	European One Planet Economy Network
Purpose	Policy, Diagnosis, Options

Description

EUREAPA is an online scenario modelling and policy assessment tool created by the One Planet Economy Network. It uses a sophisticated economic input-output model to understand the environmental pressures associated with consumption activities.

Applicability

One of EUREAPA's most important functions is the scenario editor. This can be used to explore the environmental pressures associated with changes in population, consumption patterns, production technology or trade. In addition to providing a consistent set of indicator estimates for the footprint family, EUREAPA makes this information useful and easily accessible to decision makers through a range of benchmarking, analytical and visualization facilities. It is possible to identify differences in footprints across countries from consumer and producer perspectives, and also to break down environmental impacts along global supply chains to identify footprint hot-spots.

Process of tool application

The extensive data system models the flow of goods and services between 45 countries and regions covering the global economy for 57 individual sectors over a year. The sectors cover a range from agricultural and manufacturing industries to transport, recreational, health and financial services. Supplemented with detailed carbon, ecological and water footprint data, EUREAPA can account for the full supply chain impacts associated with the food people eat, the clothes they buy, the products they consume or the way they travel. This allows the user to look at the impacts of consumption activities in the context of lifestyles or national differences.

Benefits

Through EUREAPA, it is possible to create personalised future business scenarios.

Examples

n/a.

References

https://www.eureapa.net/

6.   Green Office Checklist

Full tool name	Green Office Checklist
Author	European Green Office Project
Purpose	Diagnosis and baseline

Description

The Green Office Checklist helps to estimate how green your office already is by using the self-evaluation tool for offices. The tool is aimed at SMEs who would like to evaluate how green their office is, and potentially implement measures to improve it.

Applicability

The Green Office Checklist is a self-evaluation tool, which helps to assess the actual performance of the office, and gives clear directions for improvement.

Process of tool application

A list of 130 questions indicates your office level of 'green performance'. Various environmental topics and office activities are addressed, such as energy and building, waste production and sorting, water consumption, office furniture and consumables, organization of conferences and events, IT, paper consumption, air quality, health, safety and social issues, as well as cleaning and catering activities. The only resources needed are time and man-days to fill in checklist.

Figure 2. Example of the Excel file of the European Green Office Checklist.

The Green Office Checklist is available in a selection of seven European languages: English, Hungarian, Bulgarian, Estonian, French, Romanian and Slovene.

Benefits

The tool informs how green the office is, and highlights areas of improvement.

Examples

n/a.

References
http://eugreenoffice.eu/checklist

7. Green Office Handbook

Full tool name	Green Office Handbook
Author	European Green Office Project
Purpose	Options, Project and business planning

Description

The Green Office Handbook contains relevant information on environmental topics for offices, such as energy and building, waste production and sorting, water consumption, office furniture and consumables, organization of conferences and events, IT, paper consumption, air quality, health, safety and social issues, as well as cleaning and catering activities.

The handbook is aimed at SMEs who would like to evaluate how green their office is, and potentially implement measures about it.

Applicability

The Green Office Handbook presents relevant information on legal issues, certification and labelling, ideas and tips for performance improvement, and a list of performance indicators.

Process of tool application

In order to become an European Green Office (EGO), certain principles have to be followed. The principles of EGO can be distinguished as being both management and performance related. Management-related principles are connected to managerial matters such as setting environmental objectives and raising the environmental awareness of the staff. Performance/operation related principles characterise the performance of significant environmental aspects such as energy and waste. The handbook gives detailed information on these principles and elaboration for several sectors.

Benefits

The handbook contains information gathered together on everything a SME has to know to implement environmental tips in a dynamic way inside the office.

Examples

The handbook contains many examples which count as good practice.

References

http://eugreenoffice.eu/handbook

8. i-Care

Full tool name	enerGQ i-CARE
Author	enerGQ
Purpose	Diagnosis and analysis for households

Description

i-CARE is an energy monitoring system that helps households to save energy. Through a secured internet connection, the use of gas and electricity can be monitored from everywhere and anytime. The system takes into account relevant weather conditions and other factors that influence energy use.

Applicability

The i-CARE tool can be used by households, but also by businesses.

Process of tool application

The graphs produced by the i-CARE tool provide a clear estimate of the costs of household device in time.

The i-CARE tool is developed by a Dutch SME, based on smart meter technology, but it goes beyond that as it uses the internet to establish a household community and to calculate reference profiles for a household based on average energy use by comparable households. The reference profile describes what energy consumption could be reasonably expected. Then it shows whether the energy consumption is in line with energy saving behaviour. Through the community, moderated by the SME, households receive energy profiles, points of attention and advise for improvement and saving.

Benefits

Figure 3. Energy use analysis by i-CARE.

i-CARE analyses and shows both energy savings and surplus energy use. The energy use is constantly compared to historic data measured during comparable weather conditions at similar days of the week and times. Also other relevant factors, such as the type of house, are taken into account. The system can give notifications in case of a certain energy use level, and the energy use is compared to other, similar households.

i-CARE does not only provide data, but also gives concrete information that enables energy saving.

Examples

Examples are available on the website of enerGQ.

References

http://www.energq.com/icare

9. IPAT-S

Full tool name	IPAT-S modelling language
Author	Eric Kemp-Benedict
Purpose	Scenario development

Description

IPAT-S is an open-source modelling language that comes with a suite of supporting tools. It is well suited to developing sustainability scenarios, but can be used in other contexts. The language is compact and the interpreter is fast, so IPAT-S is a good choice for rapid scenario development.

Applicability

The IPAT-S software can be used for medium-to-large datasets (for example, a global study with national-level data) as well as for small calculations. Data can be labelled by multiple dimensions using human-readable labels (for example, region, fuel, land-use type) and by year. Linear programming models are supported as a core part of the language.

Process of tool application

IPAT-S is an open source tool, but knowledge about programming language is required.

Benefits

The IPAT-S tool enables fast scenario development.

Examples

The developer of the IPAT-S tool is a senior scientist with the Stockholm Environment Institute and has used IPAT-S on several projects. Also, although there is no formal tracking of people who use IPAT-S around the world, there are occasional reports of its use in studies of energy systems, urbanization, agricultural land use, and other applications.

References

http://www.ipat-s.org

10. LEAP

Full tool name	Long range Energy Alternatives Planning System
Author	C.G. Heaps (Stockholm Environment Institute)
Purpose	Analysis, planning

Description

LEAP is an integrated modelling tool that can be used to track energy consumption, production and resource extraction in all sectors of an economy. It can be used to account for both energy sector and non-energy sector greenhouse gas (GHG) emission sources and sinks. In addition to tracking GHGs, LEAP can also be used to analyse emissions of local and regional air pollutants, making it well-suited to studies of the climate co-benefits of local air pollution reduction.

Applicability

LEAP has developed a reputation among its users for presenting complex energy analysis concepts in a transparent and intuitive way.   At the same time, LEAP is flexible enough for users with a wide range of expertise: from leading global experts who wish to design polices and demonstrate their benefits to decision makers to trainers who want to build capacity among young analysts who are embarking on the challenge of understanding the complexity of energy systems.

In addition to its modelling capabilities, LEAP can now also be used as a tool for calculating, evaluating and displaying many social, economic, and energy-related development indicators.

Process of tool application

LEAP is intended as a medium to long-term modelling tool. Most of its calculations occur on an annual time-step, and the time horizon can extend for an unlimited number of years.

LEAP is designed around the concept of long-range scenario analysis. Scenarios are self-consistent storylines of how an energy system might evolve over time. Using LEAP, policy analysts can create and then evaluate alternative scenarios by comparing their energy requirements, their social costs and benefits and their environmental impacts.

Benefits

A key benefit of LEAP is its low initial data requirements. Modelling tools that rely on optimization tend to have high initial data requirements because they require that all technologies are fully defined both in terms of both their operating characteristics and their costs. By contrast, because LEAP relies on simpler accounting principles, and because many aspects of LEAP are optional, its initial data requirements are thus relatively low.

Examples

LEAP has had a significant impact in shaping energy and environmental polices worldwide. For example:

- In China, the Chinese Energy Research Institute (ERI) has used LEAP to explore how China could achieve its development goals whilst also reducing its carbon intensity. These studies have helped to influence national energy policies and plans.
- In the U.S., a prominent Non-Governmental Organization, the Natural Resources Defence Council (NRDC) uses LEAP to analyse national fuel economy standards and advocate for policies that encourage clean vehicles and fuels.
- In Rhode Island, LEAP has been the main organizational tool for analysing and monitoring the State's award-winning GHG mitigation process, in which multiple stakeholders are guiding the State's efforts to meet its GHG emission reduction goals.
- In the Philippines, LEAP is used by the Department of Energy to help develop its National Energy Plans.

References

Heaps, C.G., 2012. Long-range Energy Alternatives Planning (LEAP) system. [Software version 2012.0055] Stockholm Environment Institute. Somerville, MA, USA. www.energycommunity.org

11. Life Cycle Assessment

Full tool name	Life Cycle Assessment
Author	
Purpose	Diagnosis, Analysis, Options, Project and business planning

Description

In Life Cycle Assessment (LCA), the processes required to make, use, and dispose of a product are analysed to determine the raw materials, energy requirements, wastes, and emissions associated with the product's life cycle.

Applicability

LCAs conducted for product improvement can reveal processes, components, ingredients, and systems to target for environmental improvement. It can be applied to:

- identify processes, ingredients, and systems that are major contributors to environmental impacts,
- compare different options within a particular process with the objective of minimizing environmental impacts,
- provide guidance in long-term strategic planning concerning trends in product design and materials

Process of tool application

There are three main steps in a life-cycle assessment:

1) Life-cycle inventory: Determine the emissions that occur and the raw materials and energy that are used during the life-cycle of a product.
2) Life-cycle impact assessment: Assess what the impacts of these emissions and raw material depletions are.
3) Improvement/mitigation analysis: Interpret the results of the impact assessment in order to suggest improvements. When LCA is conducted to compare products this step may consist of recommending the most environmentally desirable product.

Benefits

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Examples

The results of an example of an LCA conducted for product improvement consider: This energy inventory of the life cycle of a polyester component showed that the majority of energy consumption in the life-cycle (82%) occurred during the product fabrication life-cycle stage, while ~18% occurred during its maintenance. This implies that more emissions friendly production methods should be employed.

References

http://www.utexas.edu/research/ceer/esm282/dfe/LCAoverview.PDF

12. Market mapping

Full tool name	Market mapping or system mapping
Author	Albu, M. and Griffith, A. (2005)
Purpose	Analysis, Options, Project and business planning

Description

Market or system mapping is an analysis tool to closely examine the characteristics of the markets into which, e.g., green business initiatives are deployed or diffused. The process is conducted through a participatory market chain analysis which results in the creation of a market or system map. This map shows who are market, regulatory and facilitating actors, how they are connected, where inefficiencies exist and how these can be addressed.

Albu and Griffith (2005) developed the market mapping tool to closely examine the characteristics of the markets into which small farmers in developing countries might enter.

Applicability

Market mapping is used to examine markets or systems for green business options, explore actors' interactions, identify market barriers and solutions. Market mapping is usually applied in decisions where the problem is how to deploy and diffuse a prioritised option (e.g. a green technology) at a desired scale (e.g. all SMEs within sector X in country Y).

Process of tool application

Typical activities in a market mapping process are a workshop with stakeholders, or interviews with stakeholders first to draw preliminary map and detail it in participatory workshop setting. The market mapping process requires the organisation of a workshop (room, etc.) and preferably an experienced facilitator.

An example of what a final market map could look like is the following (with enabling environment at the top, market chain in the middle and service providers at the bottom of the diagram):
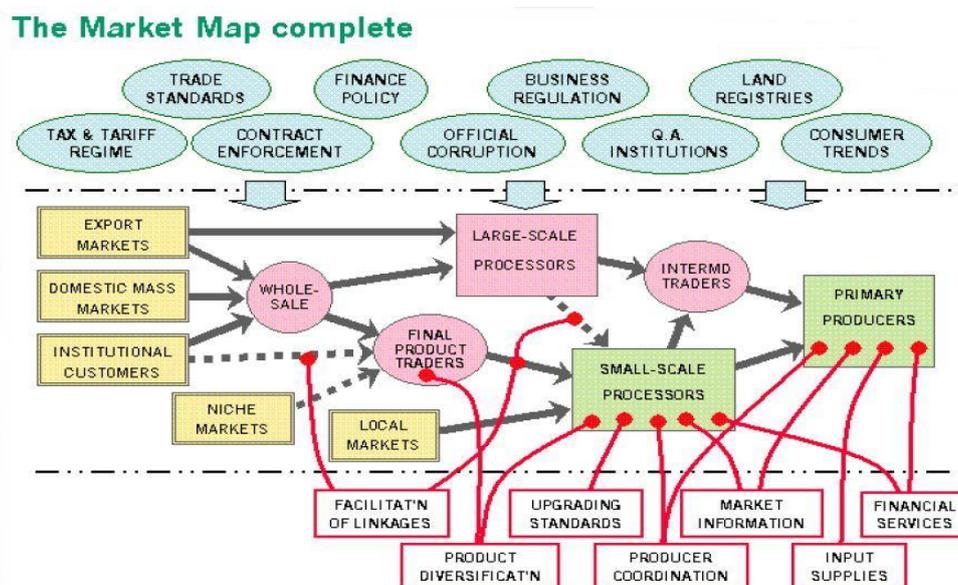

Figure 4. Example of a market map.

As the figure shows, the map of the system can be quite detailed and have quantitative information attached to the flows of goods or services or revenues shown by the arrows. How the supporting system links to the market chain is shown as red arrows.

The output of the system mapping is a snapshot of the relevant market system for a green business initiative, including the relations between the actors. This serves as a tool to identify recommended actions to increase system efficiencies for preferred pathways in the area of policies and measures, network creation, finance, removing value chain blockages, etc.

Benefits

Through market mapping, an identification of actors in the market/system and their interlinkages can be made, which is much broader than individual project-level assessment. The participatory process to arrive at market map stimulates stakeholders' ownership of green business improvement processes. The market mapping process mobilises information in 'people's minds' and extends the literature review.

Examples

- Sustainable livelihood improvement programmes led by Practical Action (mainly agricultural sectors in Africa) 2003-2005
- ENTTRANS FP6 project: prioritise technologies for climate and development in 5 developing countries 2006-2007
- UNFCCC Handbook for Conducting Technology Needs Assessment for Climate Change 2010 - ongoing
- TNA Project in Montenegro 2011-2012
- IEE BIOTEAM project 2013 **–** ongoing

References

- Albu, M. and Griffith, A. (2005). Mapping the Market: A Framework for Rural Enterprise Development Policy and Practice. Practical Action report. http://practicalaction.org/docs/ia2/mapping_the_market.pdf
- Handbook for Conducting Technology Needs Assessment for Climate Change; http://unfccc.int/ttclear/sunsetcms/storage/contents/stored-file-20130321154847356/TNA_Handbook_Nov2010.pdf
- ENTTRANS: Promoting Sustainable Energy Transfers through the CDM - Converting from a theoretical concept to practical action; http://jiqweb.org/images/stories/mifiles/projects/ClimatePolicy/enttransd2.pdf

13. MIPS

Full tool name	Material Input Per Service unit (MIPS)
Author	Wuppertal Institute
Purpose	Diagnosis, project and business planning

Description

The abbreviation MIPS stands for Material Input Per Service unit. MIPS is an elementary measure to estimate the environmental impacts caused by a product or service. The whole life-cycle from cradle to cradle (extraction, production, use, waste/recycling) is considered.

MIPS can be applied in all cases, where the environmental implications of products, processes and services need to be assessed and compared.

The Wuppertal Institute for Climate, Environment and Energy (1998) has given an introduction to Material Intensity Analysis (MAIA), based on the MIPS concept.

Applicability

The MIPS tool allows SMEs to increase profit by reducing material input for producing their products, processes or services. It helps SMEs to develop eco-innovative products and services and improve their material footprint. The tool provides information on the material intensity of produces, processes and services thus highlighting savings potentials and environmental impacts. As a result, it allows SMEs to choose green business options and to differentiate their products based on measured environmental characteristics.

In order to apply the MIPS tool, there needs to be data available on material intensity (MIT) of different materials, fuels, transport services and food, listed according to the five inputs categories of the MIPS concept. These are abiotic and biotic materials, water, air, and earth movement in agriculture and silviculture (available at http://wupperinst.org/uploads/tx_wupperinst/MIT_2013.pdf).

Process of tool application

The steps of application of the MIPS tool can be described as follows:

- Select team members
- Select a reference product
- Determine the service unit
- Identify the product chain
- Assess the current status
- Estimate the material input of the product
- MI of the whole production process or life cycle and MIPS
- Decrease the material use
- Improve the service
- Relevant design criteria

Benefits

The MIPS tool highlights potentials for resource savings and thus cost savings for SMEs. It provides better information about environmental performance of products, which can also be used for marketing purposes

Examples

The MIPS concept has been applied in multiple research projects, especially in Germany and Finland. Key examples include: Housing, mobility, glass packaging, food, household goods, tourism, leisure and sports activities.

References

- Ritthoff, M. / Rohn, H. / Liedtke, C. (2003): Calculating MIPS: Resource Productivity of Products and Services. Wuppertal Spezial No. 27e. Wuppertal. http://epub.wupperinst.org/frontdoor/index/index/docId/1577
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14. MOVE-IT!

Full tool name	MOVE-IT! blended capacity building and training package
Author	Estonian Institute for Sustainable Development
Purpose	Diagnosis, monitoring and implementation

Description

MOVE-IT! is an eco-innovative software-based support mechanism (a collective coaching and learning model) that helps to drive small and medium sized enterprises (SMEs) in the tourism sector towards lean and cost-effective EU-EMAS and Eco-label applications.

Applicability

SMEs in the touristic sector who want to obtain a certification, avoiding greenwashing, can use the MOVE-IT! toolkit.

Process of tool application

The MOVE-IT! support mechanism consists of an e-learning platform and a cluster management guide. The e-learning platform enables SMEs to be trained and tutored online via webinar sessions for the coaching of their SMEs. The platform can also be used as an assistant tool for coaching the SMEs. Furthermore, the MOVE-IT! training package involves an online software assistant called Avanti Green Software. The cluster management guide contains information and guidance for tourism developers and agents as well as SMEs for establishing and managing regional sustainable tourism clusters.

Benefits

The MOVE-IT! tool enables SMEs to structure, follow and report their environmental performance, and implement and integrate performance based labels and environmental management systems (EMAS, EU Eco-label, Green Key, and regional labels).

Examples

Best practice examples are available on the website of MOVE-IT!: http://www.move-it.eu/bestpractice. For example, Looming Hostel in Estonia is educating its clients about electricity issues. For example, where it comes from (in Estonia more than 90% of electricity comes from oil shale) or how much energy and what kind of energy is needed in order to lighten one light bulb. Clients are provided a real-life example – an opportunity to produce electricity with human power. When the client needs to take a shower he or she has two choices – either to click on a switch or to cycle on a bicycle to have light in the bathroom.

References

http://www.move-it.eu/our-project-toolkit

15. PESTLE-SWOT Analysis

Full tool name	PESTLE-SWOT Analysis
Author	
Purpose	Diagnosis, Analysis

Description

PESTLE-SWOT refers to the combination of the PESTLE (Political, Economic, Social, Technological, Legal and Environmental) and SWOT (Strengths, Weaknesses, Opportunities and Threats) analyses. The PESTLE analysis should be used to provide a context for the organisation's/individual's role in relation to the external environment. It covers Political, Economic, Social, Technological, Legal and Environmental factors. Depending on which elements are included it can also be referred to as STEP, STEEP, PESTEL, PESTLE or LEPEST. Recently it was even further extended to STEEPLE and STEEPLED, including education and demographics.

Applicability

The process underpins many other analytical techniques, such as scenario planning. The factors can be at macro (e.g. World-, EU- or UK-wide) or micro (e.g. institutional or individual) level.
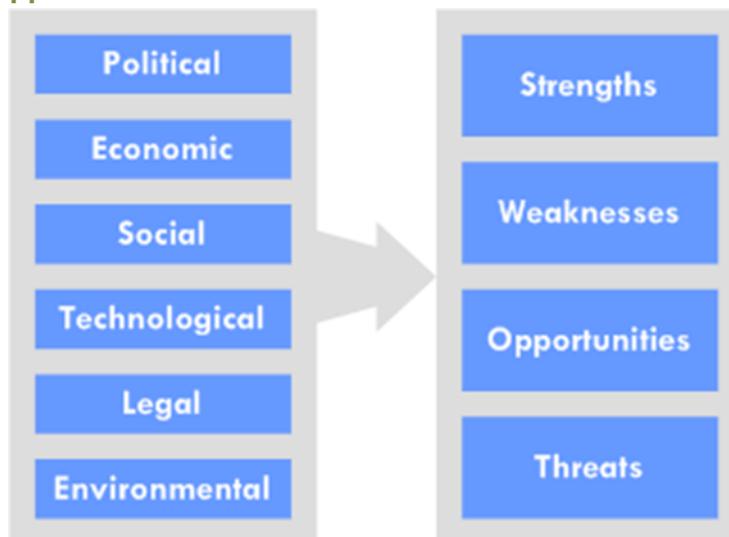
Process of tool application

Figure 5. Schematic view of the PESTLE-SWOT analysis.

Depending on the scope and scale of the exercise being undertaken, you may want to consider for each factor: Which of the below are of most importance now? Which are likely to be most important in a few years? What are the factors influencing any changes?

- **Political:** What are the key political drivers of relevance?
- **Economic:** What are the important economic factors?
- **Social:** What are the main societal and cultural aspects?
- **Technological:** What are current technology imperatives, changes and innovations?
- **Legal:** Current and impending legislation affecting the role

- **Environmental:** What are the environmental considerations, locally and further afield?

You will tend to find a lot of crossover – for example policies under political factors leading to legal and environmental factors. You do not need to worry too much about pigeon-holing issues into the right category – the framework simply helps you think about the context as a whole. Now you have the PESTLE context you can use this output to map out a SWOT analysis.

A traditional SWOT analysis would take the context of the PESTLE and analyse how these factors may emerge/impact. This may be an interesting exercise but often doesn't lead to anything apart from four lists that are filed away and forgotten. A SWOT analysis should be a useful tool for planning and marketing strategy. Identify your strengths and weaknesses first because they may suggest some of the opportunities and threats later.

A better way to map this output more directly into a project plan and/or strategy is to use a 3×3 grid, arranging your strengths, weaknesses, opportunities and threats in the labelled boxes. Then come up with some 'mini strategies' in the four boxes in the bottom right corner of the matrix, addressing the questions outlined. Having done this you can use the top left box to either translate the strategies into a task list for a project plan or come up with a strategy or mission statement for whatever topic was the subject of the SWOT analysis.

Benefits
The combination of these tools is used to find out the current status and position of an organisation or individual in relation to their external environment and current role. They can then be used as a basis for future planning and strategic management.

Examples
n/a.

References
https://docs.google.com/document/d/1PiKJDTabuGf4gln0BhlREoU_ixHm4DeXWDpg_RCm2rs/edit

http://www.jiscinfonet.ac.uk/tools/pestle-swot/

16. Porter's Five Forces

Full tool name	Porter's Five Forces Tool
Author	Michael Porter
Purpose	Analysis, Project and business planning

Description
The Porter's Five Forces tool is a simple but powerful tool for understanding where power lies in a business situation. This is useful, because it helps you understand both the strength of your current competitive position, and the strength of a position you're considering moving into.

With a clear understanding of where power lies, you can take fair advantage of a situation of strength, improve a situation of weakness, and avoid taking wrong steps. This makes it an important part of your planning toolkit.

Applicability

Conventionally, the tool is used to identify whether new products, services or businesses have the potential to be profitable. However it can be very illuminating when used to understand the balance of power in other situations.

Process of tool application

Five Forces Analysis assumes that there are five important forces that determine competitive power in a business situation. These are:

- **Supplier Power**: Here you assess how easy it is for suppliers to drive up prices. This is driven by the number of suppliers of each key input, the uniqueness of their product or service, their strength and control over you, the cost of switching from one to another, and so on. The fewer the supplier choices you have, and the more you need suppliers' help, the more powerful your suppliers are.
- **Buyer Power**: Here you ask yourself how easy it is for buyers to drive prices down. Again, this is driven by the number of buyers, the importance of each individual buyer to your business, the cost to them of switching from your products and services to those of someone else, and so on. If you deal with few, powerful buyers, then they are often able to dictate terms to you.
- **Competitive Rivalry**: What is important here is the number and capability of your competitors. If you have many competitors, and they offer equally attractive products and services, then you'll most likely have little power in the situation, because suppliers and buyers will go elsewhere if they don't get a good deal from you. On the other hand, if no-one else can do what you do, then you can often have tremendous strength.
- **Threat of Substitution**: This is affected by the ability of your customers to find a different way of doing what you do – for example, if you supply a unique software product that automates an important process, people may substitute by doing the process manually or by outsourcing it. If substitution is easy and substitution is viable, then this weakens your power.
- **Threat of New Entry**: Power is also affected by the ability of people to enter your market. If it costs little in time or money to enter your market and compete effectively, if there are few economies of scale in place, or if you have little protection for your key technologies, then new competitors can quickly enter your market and weaken your position. If you have strong and durable barriers to entry, then you can preserve a favourable position and take fair advantage of it.

To use the tool to understand your situation, look at each of these forces one-by-one and write your observations on the free worksheet. Brainstorm the relevant factors for your market or situation, and then check against the factors listed for the force in the diagram above.

Then, mark the key factors on the diagram, and summarize the size and scale of the force on the diagram. An easy way of doing this is to use, for example, a single "+" sign for a force moderately in your favour, or "--" for a force strongly against you (you can see this in the example below).

Then look at the situation you find using this analysis and think through how it affects you. Bear in mind that few situations are perfect; however looking at things in this way helps you think through what you could change to increase your power with respect to each force. What's more, if you find yourself in a structurally weak position, this tool helps you think about what you can do to move into a stronger one.

Benefits

By thinking about how each force affects you, and by identifying the strength and direction of each force, you can quickly assess the strength of your position and your ability to make a sustained profit in the industry.

Examples

Martin Johnson is deciding whether to switch career and become a farmer – he's always loved the countryside, and wants to switch to a career where he's his own boss. He creates the following Five Forces Analysis as he thinks the situation through:

- The threat of new entry is quite high: if anyone looks as if they're making a sustained profit, new competitors can come into the industry easily, reducing profits.
- Competitive rivalry is extremely high: if someone raises prices, they'll be quickly undercut. Intense competition puts strong downward pressure on prices.
- Buyer Power is strong, again implying strong downward pressure on prices.
- There is some threat of substitution.
- Unless he is able to find some way of changing this situation, this looks like a very tough industry to survive in. Maybe he'll need to specialize in a sector of the market that's protected from some of these forces, or find a related business that's in a stronger position.

References

http://www.mindtools.com/pages/article/newTMC_08.htm#sthash.jYBFwr4k.dpuf