



001

INTRODUCTION

Welcome to the joint UNEP and Delft University of Technology publication on *Design for Sustainability: a practical approach for developing economies!* In this introduction, the relevance of D4S for developing economies is highlighted. Next, the target groups of this publication are defined, and the overall structure of the publication is explained.

1.1 THE RELEVANCE OF DESIGN FOR SUSTAINABILITY (D4S)

Product Innovation

Companies all over the world increasingly need to innovate their products and processes to: keep up with competitive pressure; increase productivity within the region or worldwide; defend or expand market share; and to create the ability to attract foreign investments. However, companies in developing economies can be left out of this cycle for a variety of economic and structural reasons.

Product innovation is becoming one of the key strategic options available to firms, supply chains and integrated industrial sectors in developing economies to compete better in today's global market. Through advances in information, communication and infrastructure, local and international markets are becoming more competitive and challenging - obliging companies to adapt.

The interest in product innovation has grown rapidly during the past decades. Industrialisation, open markets, higher (quality) requirements from customers and an increase in competitiveness between companies locally and globally have created a serious demand for a structured process for product innovation within industry. Industries cannot survive in the long-run without product innovation as an integral part of the company management and product development processes. International industries have reacted to these developments by creating their own product innovation departments or by consulting with external product innovation experts. Many

medium-sized or large companies have at least one product innovation expert in their management team.

In developing economies the importance of product innovation is rapidly increasing as well. In India, for example, product innovation has become an important discipline, especially after the Indian market opened to international competition.

Small- and medium-sized industries (SMEs) will need to focus on product development as well. In addition to in-house product development expertise, this can be done by cooperating with sector organisations, or bringing in external experts from consultancies, universities and other expertise centres.

Products and Sustainability

Growing global concerns about environmental problems such as climate change, pollution and biodiversity loss and about social problems related to poverty, health, working circumstances, safety and inequity, have fostered sustainability approaches for industry. In the international policy arena, as illustrated by the World Summit for Sustainable Development, governments, industry and civil society have adopted the term sustainable consumption and production.

Improved product design which applies sustainability criteria - Design for Sustainability (D4S) - is one of the most useful instruments available to enterprises and

governments to deal with these concerns. D4S includes the more limited concept of Ecodesign or Design for the Environment. In many developed economies D4S is closely linked to wider concepts such as sustainable product-service systems, systems innovations and other life cycle based efforts. In developing economies a lack of awareness remains a stumbling block.

A broad definition of D4S would be that industries take environmental and social concerns as a key element in their long-term product innovation strategy. This implies that companies incorporate environmental and social factors into product development throughout the life cycle of the product, throughout the supply chain, and with respect to their socio-economic surroundings (from the local community for a small company, to the global market for a transnational company (TNC)).

UNEP and Delft University of Technology

This publication was drafted by the Design for Sustainability (DfS) Programme of Delft University of Technology for UNEP's Production and Consumption Unit of the Division of Technology, Industry and Economics. Both organizations have been active in the area of promoting more sustainable product design since similar concepts were introduced in the 1990s.

Many organizations have developed tools and approaches to help companies (and those who work with companies) rethink how to design and produce products to improve profits and competitiveness and to reduce environmental impacts at the same time. In 1997 UNEP, in conjunction with Delft University of Technology and other experts in Ecodesign, published the ground-breaking manual "Ecodesign: A Promising Approach to Sustainable Production and Consumption." The concept of product eco-design has since then spread as seen in the number of manuals and sector-specific supporting materials that are available in many languages. As a result, and based on experience, Eco-design has evolved to encompass broader issues of the social component of sustainability and the need to develop new ways to meet consumer needs in a less resources intensive way. D4S goes beyond how to make a 'green' product and now embraces how best to meet consumer needs more sustainably on a systematic level.

UNEP's activities in the D4S area are varied. At the

core, is the development of a new global guide for designers and industry providing support and guidance on the evolved concept of D4S (Design for Sustainability: A Global Guide, UNEP 2006). It is useful to those new to eco-design as well as those interested in breakthrough innovation for sustainability. The guide is the result of the long-term cooperation of international D4S experts from the Netherlands, Sweden, Italy, France, Germany, Japan and Australia, UNIDO, the Swedish EPA and InWEnt, Germany and reflects the evolution of the concept since the initial guide was produced in 1997.

However, many sector- and country-specific issues still need to be addressed. In developing economies products tend to be 'benchmarked' (copied) from those existing on the market. Companies are concerned about developed country markets. They need to take into account standards of developed country markets to gain access. In general, there is an overall lack of awareness in companies on how to improve efficiencies and improve environmental performance at the same time.

As a result, UNEP sponsored the development of this publication that provides a simple step-by-step methodology that focuses on the needs of small- and medium-sized enterprises (SMEs) specifically in developing economies. UNEP invites partners - companies, industry associations, governmental bodies, and educators - to join and collaborate in developing additional sector and/or product-specific packages to promote D4S more widely.

The DfS Programme of the Delft University of Technology in The Netherlands has extensive experience in sustainable product innovation in developing economies. Several product innovation programmes have been carried out in Africa, Asia and Latin America over the last ten years, and new projects are started regularly. The projects are carried out in close cooperation with partners from local industries, transnational companies, universities, governments and non-governmental organisations. Several of the company projects serve as case studies in this publication.

1.2 TO WHOM IS THIS PUBLICATION ADDRESSED?

This publication has been written for intermediaries that work with SMEs in developing economies, such as

centres of excellence (UNIDO-UNEP's National Cleaner Production Centres), business associations, consultants or universities. Next to these intermediaries, the publication can also be used by companies that are partners in a product innovation project or programme. The chapters on how to do D4S Redesign and Benchmarking are specifically written to be used by a project team of company representatives and intermediaries to execute a product innovation project.

Ideally, the D4S approach can be used in a collaborative process with several partners for whom this publication can serve as a reference methodology, and a source of information and experience.

1.3 HOW IS THE PUBLICATION ORGANIZED?

This publication has three parts, and each part has three chapters.

The first part, **What is D4S and why do it?** (Chapters 1 to 3) describes the D4S concept in more detail and what might motivate companies in developing economies to adopt it. Chapter 2 provides an overview of the relationship between sustainability and product innovation, which lead to the concept of D4S. The reasons and opportunities for SMEs in developing economies are explained. For the companies involved in a D4S project it may be the first time they have been involved in a systematic product development process. Therefore, Chapter 3 provides basic information on the concept of product innovation, and explains the steps of a product development process. The insights gained from this part can assist companies and intermediaries who work with companies in identifying the appropriate approach to product development and sustainability.

The second part, **How to do D4S in practice** (Chapters 4 to 6) is the backbone of this publication. It explains three practical, step-by-step approaches to execute a D4S project in a company. Chapter 4, the D4S Needs Assessment shows how to evaluate the economic position of a country and how to prioritize industry sectors in order to target the selection of demonstration project companies. This chapter is intended for intermediaries who set up a D4S programme or project. Chapter 5 outlines the step-by-step approach to carry out a D4S Redesign project, aimed at the sustain-

ability-driven, incremental improvement of an existing product. In Chapter 6, the D4S Benchmarking approach is presented. In short, the approach is to use competitors' efforts to develop new products. This approach is especially suitable for those companies that develop products based upon imitating existing products. The redesign and benchmarking approaches are complementary to each other and can be used in combination.

For each of the three practical approaches of Part II, a set of accompanying worksheets is available on the CD-ROM which is inserted at the back of this publication. All worksheets are referenced in the text.

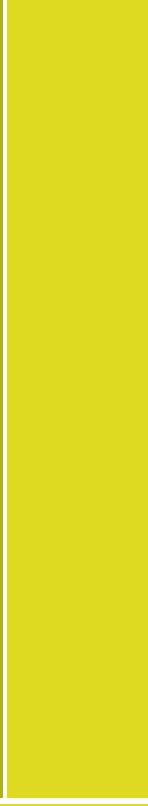
In Part III, Reference information on D4S, additional information is provided that can support the execution of a D4S project. Chapter 7 provides the reader with D4S case studies from developing economies. These case studies are examples for specific phases and strategies that are explained in Part II. Chapter 8 presents 'rules of thumb' for carrying out a D4S project. These are basic suggestions to consider when identifying sustainable product improvement options. Chapter 9 gives an overview of creativity techniques that can be applied by a D4S team during a project to come up with creative and novel solutions for product innovation issues. Lastly, suggestions for further reading are given.

On several places in the text, reference is made to other publications by citing the authors' name and the year of publication. These and other references can be found in the section 'Resources and further reading' after Chapter 9 of the publication.

The publication is supported by additional materials on the accompanying CD-ROM, including a printer-friendly PDF file of the whole publication, which is also available on the web at: www.d4s-de.org

An overview of the publication is in Figure 1.

PUBLICATION OVERVIEW



D4S IN DEVELOPING ECONOMIES

PART I WHAT AND WHY D4S

CH.1 > INTRODUCTION
CH.2 > DESIGN FOR SUSTAINABILITY
CH.3 > PRODUCT INNOVATION

PART II HOW TO DO D4S

CH.4 > D4S NEEDS ASSESSMENT
CH.5 > D4S REDESIGN
CH.6 > D4S BENCHMARKING

PART III REFERENCE INFORMATION

CH.7 > D4S CASE STUDIES
CH.8 > D4S RULES OF THUMB
CH.9 > CREATIVITY TECHNIQUES

FURTHER READING

WORKSHEETS ON THE CD

N > NEEDS ASSESSMENT
R > REDESIGN
B > BENCHMARKING

ADDITIONAL MATERIALS
ON THE CD AND ON
WWW.D4S-DE.ORG

FIGURE 1 ___ PUBLICATION OVERVIEW