

# Chapter X

## Sustainable Product Service Systems:

### Potential to Deliver Business and Social Benefits with Less Resource Use

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#### **ABSTRACT**

*This chapter introduces sustainable product service systems (S-PSS) as a means of achieving both forward and reverse supply chain utilization, leading to much improved resource productivity coupled with business and social benefits. It outlines the challenge to enable economic growth, especially in developing countries, with corresponding reduction in consumption of resources, greenhouse emissions, and waste. It is argued that S-PSS can make a significant contribution, not only in greening products, but also in poverty alleviation, employment generation, and social development. An Australian, industry-based product stewardship scheme for used computers is first outlined. The potential for S-PSS to take product stewardship to a new level is then explained, with reference to several Hewlett-Packard case studies and research involving Interface modular carpets. The author hopes that the potential for S-PSS to deliver business and social benefits with less resource use may be recognized, leading to necessary further investigation and research.*

#### **INTRODUCTION**

The notion of *product service systems* (PSS), whereby products are not sold to customers but are provided as part of a service or rental contract, originated in the business world due to

perceived business benefits. More recently, it has been recognized that such systems may also have environmental advantages because they facilitate take-back, reuse, and recycling, thus reducing material consumption, energy, emissions, and waste. Hence, the concept of *sustainable product service*

*systems* (S-PSS) has gained in usage, especially in Europe, and exemplifies the “service economy.” However, its application to the Asia Pacific region, and especially developing countries, is a relatively unexplored area. S-PSS has the potential not just for greening of business but also for achieving economic development, improving the lives of the poor and contributing towards achievement of the UN Millennium Development Goals (see <http://www.un.org/millenniumgoals/goals.html>). It may become an important mechanism for advancing “Green Growth,” environmentally sustainable economic growth for the benefit of all, a concept promoted by the UN (ESCAP, 2006).

This chapter examines the basic principles of S-PSS, and the potential environmental and business benefits, outlining some preliminary research at the University of South Australia. Drawing upon several case studies, it shows how PSS may be exemplified by the Hewlett-Packard (HP) approach to selling services and how this may lead to S-PSS. The chapter then highlights the exciting potential for applications in developing countries.

### **THE CHALLENGE: ECONOMIC GROWTH WITH LESS RESOURCE USE**

As Manzini and Vezzoli (2002) have acknowledged, developing countries need to go through a process of economic growth to reach a similar standard of living of developed countries, with some increase in consumption of natural resources to be expected. The challenge is to achieve necessary growth but with less resource use and “ecological footprint,” a measure of the impact of resource consumption and waste on the planet (see <http://www.footprintnetwork.org/>). If developing countries follow the extravagant consumption pattern of the west (footprint exceeding 5 global hectares per person) then the planet will be unable to cope with the pressure on resources.

In this regard, the western or Fordist “production-consumption model,” based on growth and throughput, is not the way forward. This model exhibits a linear material flow: resource extraction-production-consumption-waste; increase of productivity only becomes possible by using more fixed capital and consuming growing quantities of matter and energy (Altvater, 1993). The business application of PSS may act as an opportunity to facilitate the process of industrialization in developing countries, by “leap-frogging” the stage characterized by individual consumption/ownership of mass produced goods towards the more advanced service economy, thus avoiding some of the mistakes made by developed countries (Manzini & Vezzoli, 2002). PSS is increasingly seen as a possible and promising solution for the sustainable development dilemma, although a major cultural shift is required (Leong, 2006). This is especially so with some consumer products, where ownership is a symbol of status and style. Perhaps the biggest potential for PSS is in business transactions, where ownership may assume less importance.

Associated with the global 3R Initiative (Japan Ministry of the Environment, 2005), involving reduce, reuse, and recycle, various countries have embraced a new economic growth mode that operates in the way of resource extraction - production - consumption - regenerated resources. This is reflected by Korea’s “resource circulating society,” Japan’s “sound material-cycle society,” Thailand’s “sufficiency economy,” and the “circular economy policy” of the People’s Republic of China. By organizing economic activities in a closed-loop of materials, these approaches promote harmony between the economic system and the ecosystem, consistent with the notion of a “cyclical restorative economy” introduced by Hawken (1993). New types of industrialization are being pursued, with the eco-efficiency of take-back and recycling being well understood (Huisman & Stevels, 2006). Among these, product and service design to promote reduce, reuse, and recycling of

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