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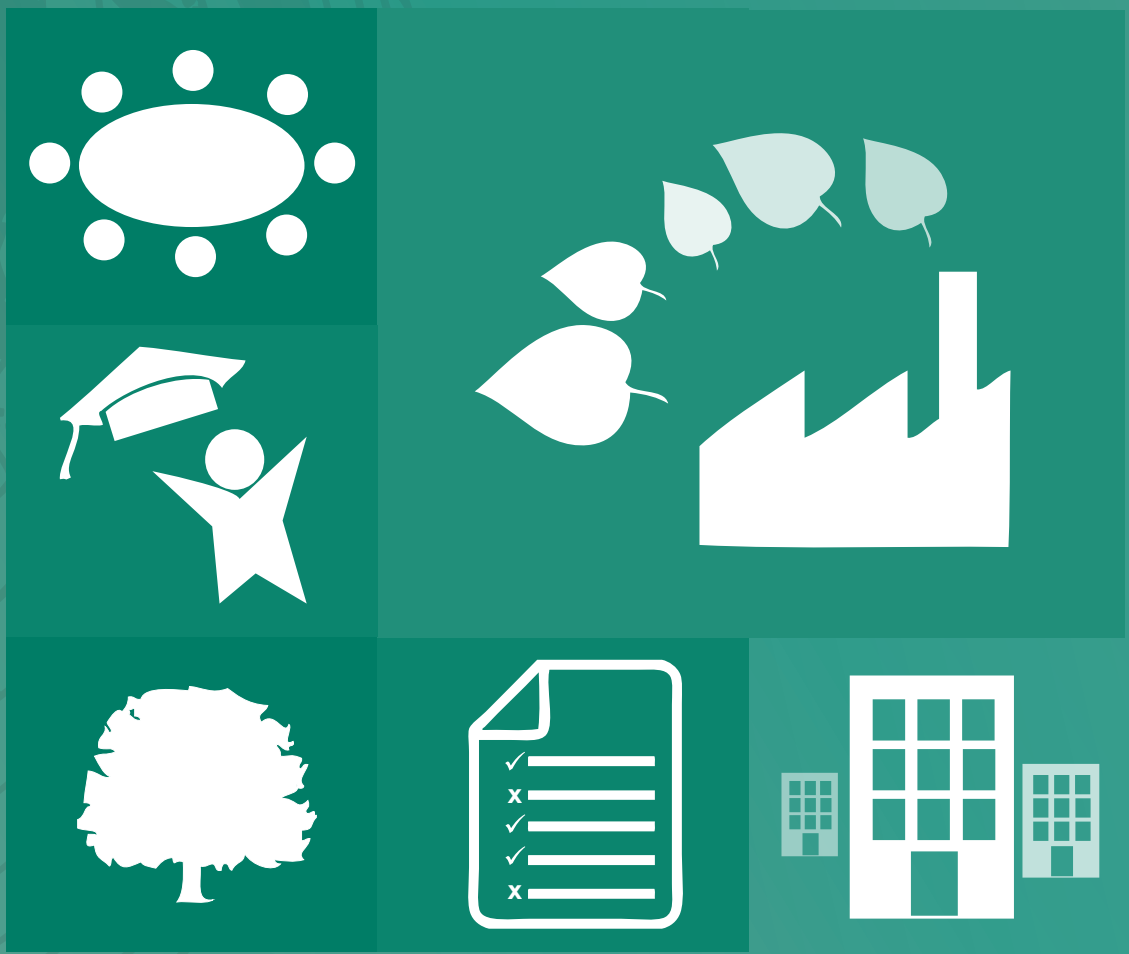
Sustainable Consumption and Production: A Handbook for Policy Makers

With cases from Asia and the Pacific



United Nations Environment Programme

First edition

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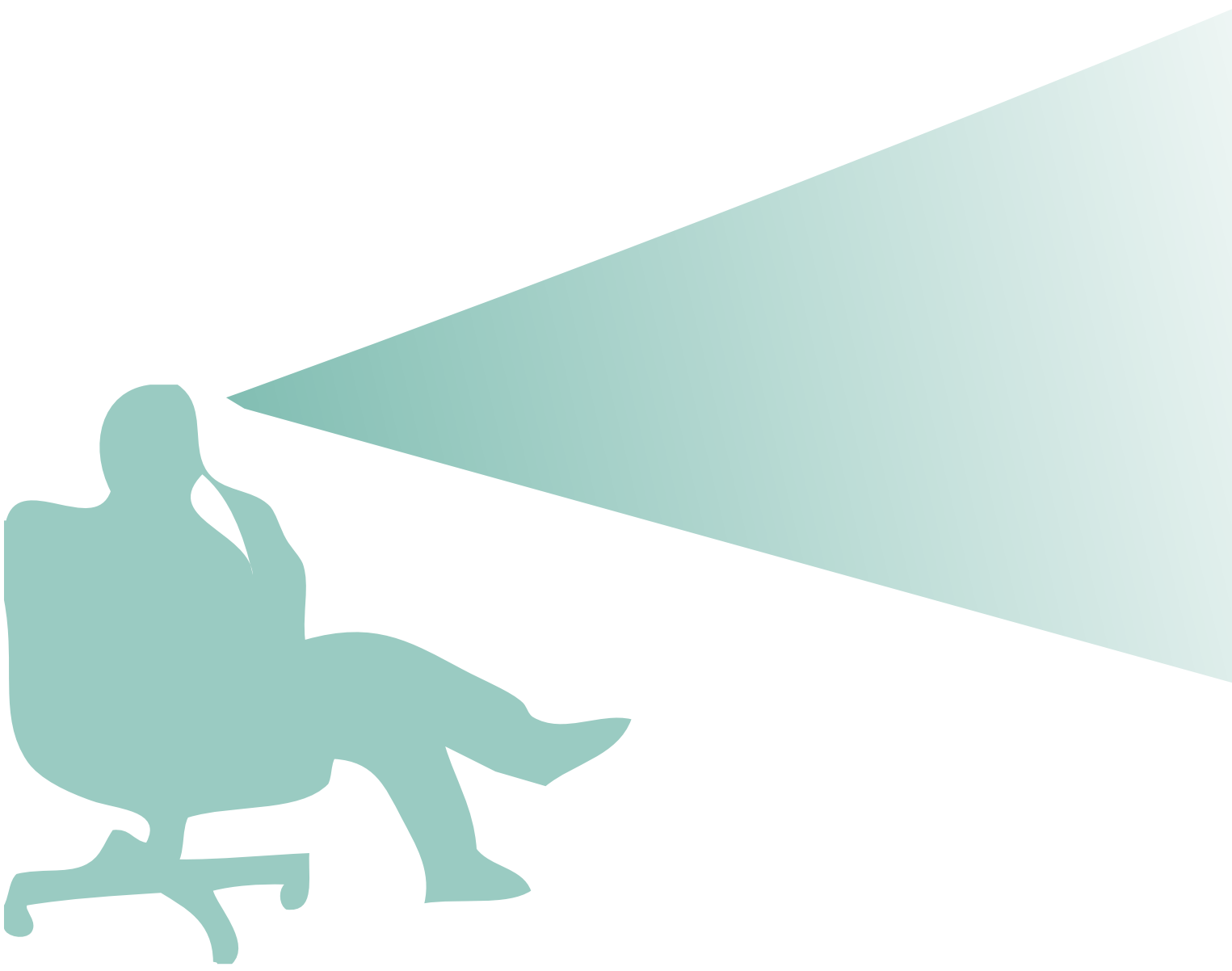

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Introduction

It is an exciting and dynamic time in Asia and the Pacific. In recent years, the region has experienced unparalled economic and social development. Economic activity, production and manufacturing have increased dramatically, with the region often referred to as the workshop of the world. The population is booming, now home to around two thirds of the world's people. However, these achievements and changes have come at a significant cost to the environment. Increasing demands for energy, food, water and other resources have resulted in resource depletion, pollution, environmental degradation and exacerbation of climate change, pushing the earth towards its environmental limits. With humans now consuming more resources than ever before, the current patterns of development across the region and the world over are not sustainable.

One of the key elements for achieving sustainable development is the transition towards sustainable consumption and production. This need was first highlighted at the Rio Earth Summit in 1992 and was recently reiterated in the outcomes of the Rio +20 summit. Sustainable consumption and production (SCP) is about fulfilling the needs of all while using less resources, including energy and water and producing less waste and pollution. SCP is essential for improving the lives of the regions poorest people, who depend so closely on the natural resources provided by their environment. SCP can lead to an improved quality of life and greater employment opportunities complimenting poverty reduction strategies. The continuing developments required across the region provide immense opportunity for SCP.

Sustainable consumption and production cuts across many different sectors and requires the engagement of numerous stakeholders. It requires collaboration between multiples areas and levels within government to develop, implement, monitor and evaluate successful SCP policies. It requires policy to not just improve production, but also to support consumers to move towards sustainable consumption choices. Therefore ***everyone*** in society has a role to play in this transition including governments, educators, the private sector and each and every consumer.

This manual is designed to assist policy makers in developing, implementing, monitoring and evaluating policies that support the transition towards SCP. This is the first manual of its kind, developed specifically for use in the Asia-Pacific context. The manual includes numerous case studies highlighting SCP opportunities and existing successful initiatives within the region. Part A provides an introduction to the fundamentals of SCP and follows SCP throughout the policy cycle. Part B details specific thematic opportunities for SCP policy development including cleaner and safer production, sustainable lifestyles, sustainable cities, sustainable public procurement and sustainable tourism.

Part A :

AN INTRODUCTION TO SCP POLICY

1 Introduction to Sustainable Consumption and Production (SCP)

1 Introduction to Sustainable Consumption and Production (SCP)

SCP?

Key Learning Points

- Definitions of SCP vary slightly but the underlying principles remain the same.
- The terms "SCP", "Green Growth" and "Green Economy" are inextricably linked and lead to the same overall objective which is sustainable development.
- SCP is closely linked to Resource Efficiency – the optimal usage of resources, particularly scarce and non-renewable resources.
- Within the international environmental agenda, SCP has evolved from a topic of interest back in the 80's to priority for sustainable development in the beginning of the 21st century and finally to a comprehensive holistic framework of approaches, practices and policies for sustainable development
- If current resource use trends continue Asia will become the single biggest consumer of natural resources.

This chapter defines SCP and provides an introduction to the history of SCP in international policy, starting from the United Nations conference on Environment and Development in 1992 (the 'Rio Summit') to the most recent Rio +20 conference. The impacts of consumption and production and socio economic development across Asia-Pacific are examined, highlighting the need for a transition towards SCP, as a key element for sustainable development.

1.1 Defining SCP

Definition of Sustainable Consumption & Production (SCP):

The concept of SCP has also evolved over time and is defined in a number of ways.

A commonly used definition is: "the use of services and related products which respond to basic needs and bring a better quality of life while minimising the use of natural resources and toxic materials as well as the emission of waste and pollutants over the life cycle of the service or product so as not to jeopardise the needs of future generations" (ISSD 1994).

Another widely used and more recent definition is provided by UNEP: *"SCP is a holistic approach to minimising the negative environmental impacts from consumption and production systems while promoting quality of life for all"* (UNEP 2011).

The International Institute for Sustainable Development list 3 other definitions of sustainable consumption and/or production (see www.iisd.org/susprod/principles.htm) and doubtless there will be even more by other bodies. Regardless of definitions, the underlying principles of SCP must be clear.

Key principles of SCP:

1. Improving the quality of life without increasing environmental degradation and without compromising the resource needs of future generations.
2. Decoupling economic growth from environmental degradation by:
    - Reducing material/energy intensity of current economic activities and reducing emissions and waste from extraction, production, consumption and disposal.
    - Promoting a shift of consumption patterns towards groups of goods and services with lower energy and material intensity without compromising quality of life. (See Box 1:4).
3. Applying life-cycle thinking which considers the impacts from all life-cycle stages of the production and consumption process.
4. Guarding against the re-bound effect, where efficiency gains are cancelled out by resulting increases in consumption (UNEP 2011).

SCP and Green Growth/Green Economy:

The key principles of SCP can be applied to the ideas of 'Green Growth' and arriving at a 'Green Economy'. "Green Growth is a policy focus for the Asia-Pacific Region that emphasises environmentally sustainable economic progress to foster low-carbon, socially inclusive development" (UNESCAP n.d.). UNEP describes a Green Economy as "one whose growth in income and employment is driven by public and private investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, and prevent the loss of biodiversity and ecosystem services" (UNEP n.d). As will be evident, the basic tenets are the same but these two concepts draw attention to a critical element: the financing of sustainable consumption and production and the investments required to achieve it. Overall, the concepts of Green Economy and Green Growth should not be seen as alternative definitions of sustainable development but as specific pathways that can assist countries to achieve sustainable development.

Resource Efficiency and SCP

Resource efficiency is the general concept of using less resource inputs to achieve the same or improved output (resource input/output). It indicates the effectiveness with which resources are used by individuals, companies, sectors or economies. Resource efficiency can be achieved by increasing resource productivity (value added / resource use) or reducing resource intensity (resource use / value added). It is related to strategies like dematerialisation, such as fuel efficient cars.

Box 1:1 A classic case of inefficiency

A classic case of deliberate resource inefficiency is the ink-jet printer. These are sold at low prices but designed to take only disposable ink cartridge refills where the replacement cartridge could be almost as expensive as the printer. Attempted re-filling of the cartridge by the user voids the warranty for the printer itself.

The very definition of SCP calls for preserving resources so that future generations are not deprived of them. It will be clear that no production can be said to be sustainable if it is profligate in the use of resources, thus there is a direct link between resource efficiency and SCP, particularly sustainable production. *Prima facie*, no manufacturer should use an excess of raw materials in the production of a good if the same good could be made with fewer raw materials and thus at a lower cost. Yet instances abound of products which are *designed* in a manner where replacement is intrinsic to the product – for example disposable razors or cigarette lighters. The sustainable use of resources must be considered during all the stages of a product's life-cycle: in its design, its manufacture, its usage and even at the end of its life, where the possibility of reusing or recovering scarce materials used in its production becomes a distinct and often profitable issue. Resource efficiency is only possible if consumers – individuals and institutional buyers alike – demand sustainable products. If a demand exists for un-necessarily resource-intensive products, then one manufacturer or the other will meet the demand. Resource-efficiency is thus inextricably linked to both consumption and production.

1.2 Evolution of SCP in International policy

From the Club of Rome and the birth of UNEP to the Rio conference

A fairly recent history of international sustainability policy can be dated from the 1972 UN Conference on the Human Environment. This was in the same year as the release by the Club of Rome of the landmark publication *The Limits to Growth* with a clarion call to shift course away from the economic growth paradigm in order to avoid overshoot and collapse (Meadows et al. 1972). It wasn't until 1992 at the UN Conference on Environment and Development held in Rio de Janeiro, that for the first time at a top level international agenda-setting policy meeting, world leaders acknowledged that "the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production" (UN 1992). Seven years later, in 1999, the UN General Assembly updated its Guidelines for Consumer Protection to include a section on sustainable consumption (see Box 1.2).

Box 1:2 United Nations guidelines on sustainable consumption

In 1985, prior to the Rio conference in 1992, the UN General Assembly adopted the UN Guidelines for Consumer Protection, an international framework that provides support for activities of consumer organisations as well as guiding principles for the development of national consumer protection legislation (UN 2003b). The guidelines included the rights to: safety, information, choice, representation, education, redress, a healthy environment and basic needs. Later on, to reflect growing concerns in unsustainable patterns of consumption and production and the need to bolster government and other stakeholder efforts to promote sustainable consumption, the guidelines were expanded in 1999 with Section G on "Promotion of Sustainable Consumption". Recently, new developments in technology, forms of social organisation, and business practices, present new challenges that are not currently reflected in the Guidelines. The United Nations Conference on Trade and Development (UNCTAD) has announced that it will start a new revision of the guidelines, to be tabled for adoption in 2014.

The guidelines call on Governments (in partnership with other stakeholders) to take leadership in several actions, including:

- "develop and implement strategies that promote sustainable consumption through a mix of policies"
- "removal of subsidies that promote unsustainable patterns of consumption and production"
- "encourage the design, development and use of products and services that are safe and energy and resource efficient, considering their full life-cycle impacts"
- "impartial environmental testing of products"
- "safely manage environmentally harmful uses of substances and encourage the development of environmentally sound alternatives for such uses"
- "develop indicators, methodologies and databases for measuring progress towards sustainable consumption at all levels"

The final Declaration from Rio (UN 1992b) proclaims that "to achieve sustainable development and a higher quality of life for all people, States should reduce and eliminate unsustainable patterns of production and consumption and promote appropriate demographic policies." Chapter four of Agenda 21, the blueprint for action resulting from Rio, was dedicated to "changing consumption patterns". To achieve SCP, Agenda 21 called for actions towards two broad objectives:

a. Promote patterns of consumption and production that reduce environmental stress and meet the basic needs of humanity.
b. Develop a better understanding of the role of consumption and how to bring about more sustainable consumption patterns.

Box 1:3 Under-consumers and over-consumers: A "multipronged" approach

International SCP policy recognises the imbalances in consumption patterns between developing countries and industrialised countries. Coming from the Rio conference, it was acknowledged through Agenda 21 that: "Although consumption patterns are very high in certain parts of the world, the basic consumer needs of a large section of humanity are not being met. This results in excessive demands and unsustainable lifestyles among the richer segments, which place immense stress on the environment. The poorer segments, meanwhile, are unable to meet food, health care, shelter and educational needs."

It was cautioned that in pursuing sustainable development at the international level, any measures "must take fully into account the current imbalances in the global patterns of consumption and production". It recommends a "multipronged strategy focusing on demand, meeting the basic needs of the poor, and reducing wastage and the use of finite resources in the production process" – this allows for populations that are over consuming to reduce their consumption levels, while those with populations that are yet to meet their basic needs should increase their consumption levels in order to have sustainable livelihoods and an improved quality of life.

Agenda 21 asks for special attention on extraction of, and efficient use of natural resources as well as pollution reduction. It further calls for research to "assess the relationship between production and consumption, environment, technological adaptation and innovation, economic growth and development, and demographic factors" (UN 1992b). One of the most notable propositions from Rio that has come to be considered central to SCP is the call for "new systems of national accounts" that do not depend on economic growth but rather on "new concepts of wealth and prosperity which allow higher standards of living through changed lifestyles and are less dependent on the Earth's finite resources and more in harmony with the Earth's carrying capacity".

From Rio to Johannesburg and the Marrakech Process

The central role of SCP in achieving sustainable development was reaffirmed at the World Summit for Sustainable Development in 2002 (Johannesburg); SCP was declared one of the three "overarching objectives of, and essential requirements for, sustainable development" (UN 2003) – the other two objectives are environmental protection and poverty reduction. To translate SCP objectives into action, the Johannesburg Plan of Implementation called for the development of: "a 10-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes and reducing resource degradation, pollution and waste" (UN 2003). This would form the basis of the so-called Marrakech Process.

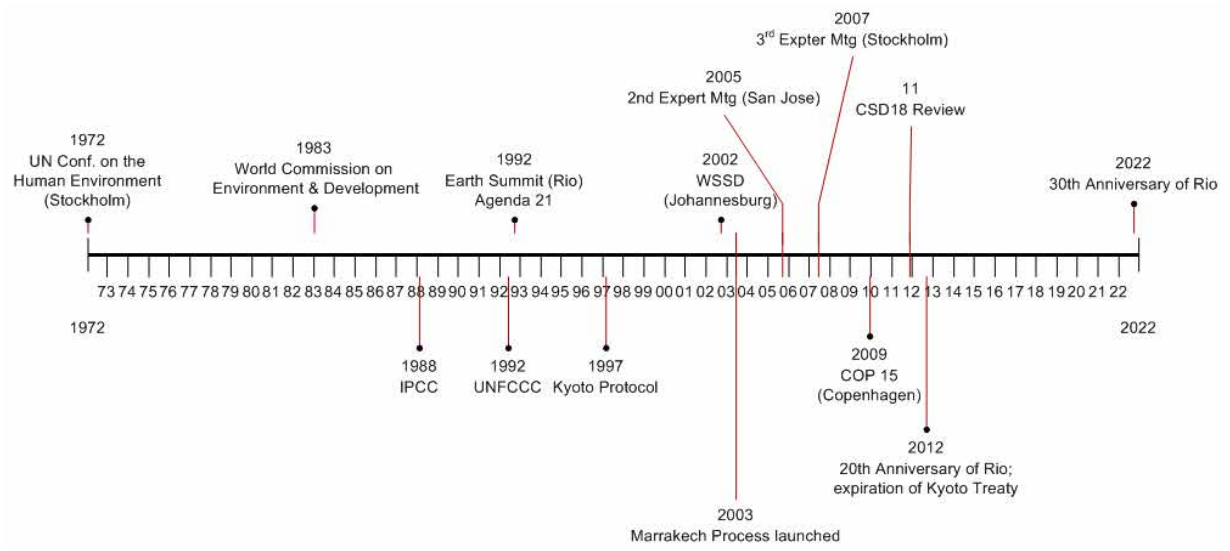
In June 2003 UNEP and UNDESA organised the first international meeting of 115 experts from 59 countries and 9 international organisations to start the process of developing the SCP global framework of programmes. As the meeting where the process began was held in Marrakech, it came to be called the Marrakech Process. For 10 years, the process involved regional consultations to identify priority issues and areas that would form the basis of programmes, formation of topical international task forces and dialogues with different stakeholder groups.

During the period following Johannesburg and the Marrakech Process, most countries have initiated SCP programmes, some with specifically designed National Action Plans on SCP or Sustainable Development, most with laws, policies and programmes aimed at different elements such as waste reduction/disposal, pollution, resource conservation, public procurement and the like. Brazil, Burkina Faso, Colombia, Cote d'Ivoire, Croatia, Dominica, Ecuador, Ghana, Indonesia, Kazakhstan, Mali, Mauritius, Senegal, St Lucia, Tanzania, Uganda and Zambia have dedicated SCP or sustainable development strategies. China and the Republic of Korea have "Green Growth" strategies which are effectively SCP strategies. The European Commission came out with the Sustainable Consumption and Production and Sustainable Industrial Policy (SCP/SIP) Action Plan in 2008 and this has proved a model for many other nations. Canada does not have a national strategy for SCP but has specific policies for different sectors, such as the Canadian Green procurement Policy of 2006 which influences over 5 USD billion of commodities. (UNEP 2011)

A review of the progress of the Marrakech Process towards development of the 10 Year Framework on Programmes (YFP) was done by the Commission for Sustainable Development (CSD) at the 18th session, in 2010. It examined some of the barriers and constraints in implementation, as well as lessons learned and best practices. Some of the challenges included dealing with the extremes of wealth – over-consumption on the one hand and under-consumption on the other hand – under a common programme, especially given that poverty was becoming more visible in some industrialised countries while a new consumer class was over-consuming in some developing countries. There were also challenges on how to concretely define the programmes – SCP being a broad area that covered many sectors and issues.

The following cycle (CSD 19) delegates negotiated and agreed upon a text for the 10YFP, including a coordinating secretariat, a financing mechanism and an indicative set of programmes. Yet at the end, although many countries stressed the strategic relevance of the 10YFP, because of a broader lack of agreement on other issues, the CSD 19th did not officially adopt a negotiated outcome on the 10YFP (IISD 2011).

Figure 1:1 A history of SCP in international policy



Rio +20 and the 10YFP

The non formal adoption of the 10YFP during the CSD's 19th cycle presented the opportunity to seek endorsement and adoption of the 10YFP at the highest possible international policy level. In the preparatory meetings for the Rio+20 conference, countries forwarded the agreed upon text from the CSD and proposed it be adopted as one of the outcomes of the Rio+20 – organised on the 20th anniversary of the first Rio conference.

In Rio in 2012 governments reiterated messages coming from Agenda 21 and the Johannesburg Plan of Implementation, and declared "We recognise that fundamental changes in the way societies consume and produce are indispensable for achieving global sustainable development." The negotiated text of the 10YFP from the CSD was formally adopted! Contained in the text are the following:

- The programmes should cover a period from 2012 – 2014. It is understood that the general assembly could alter this period to a later one, given that the original text was negotiated for adoption one year before.
- Multi-stakeholder participation – including governments, international organisations, private sector, civil society organisations, etc.
- The framework should draw from experiences such as from the Marrakech process, and possibly integrate the related task forces.
- UNEP should serve as the secretariat in collaboration with relevant UN agencies and closely cooperating with member states.
- A trust fund to receive and mobilise resources to be used in support of implementation of the 10YFP in developing countries.

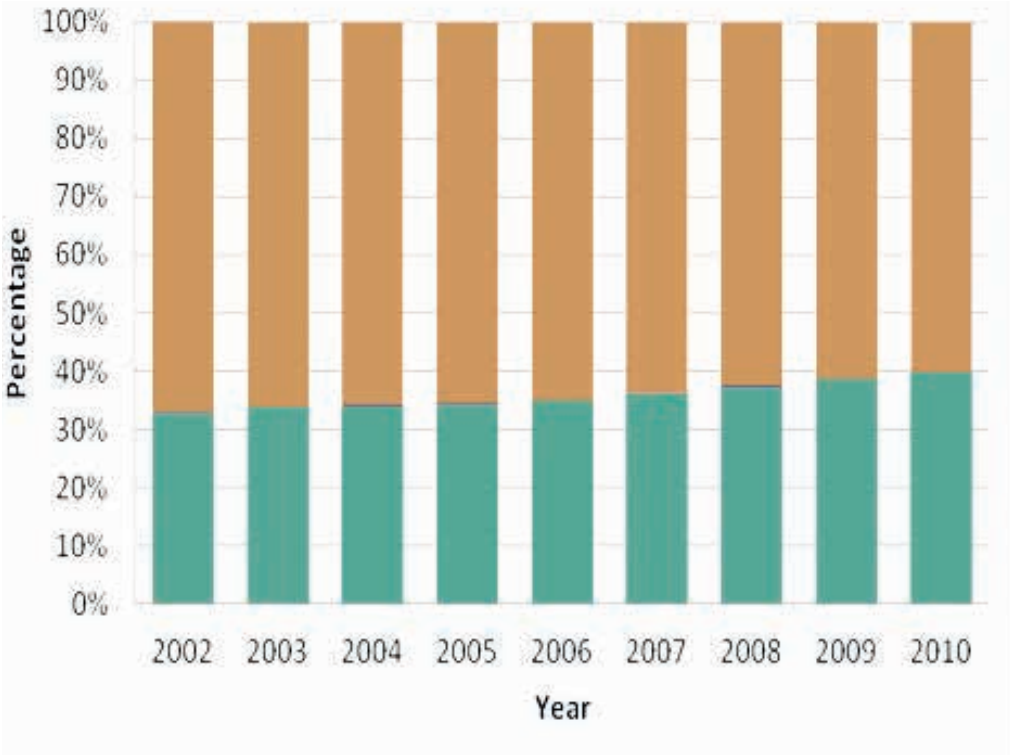
Although for some experts and the media, Rio+20 did not produce the dramatic results that many had demanded, the above steps firmly establish the role of SCP in sustainable development in the foreseeable future. In a rapidly changing world facing challenges such as on-going poverty, climate change, energy and financial crises, the shift toward sustainable consumption and production is an essential requirement for sustainable development.

1.3 Why is SCP important in Asia-Pacific?

Social and economic trends in the Asia-Pacific

There are fundamental socio-economic factors that make SCP particularly important in the Asia-Pacific region. The past few decades have seen increases in population, average incomes (and consumption rates), urbanisation (and infrastructure investment) and a huge growth in production activities. These trends have contributed immensely to economic development in the region, creating jobs, increasing the material standard of living of its people, enabling investment in public infrastructure and reducing poverty levels. These trends are closely 'coupled' to trends in resource use and emissions. Figures 1.2 and 1.3 highlight the recent rise of manufacturing across the region.

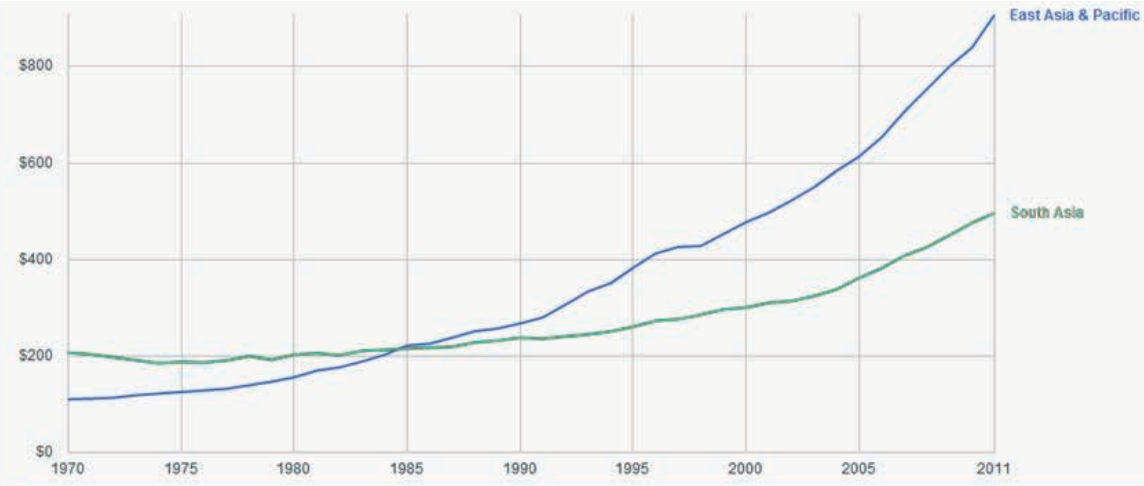
Figure 1:3 Share of global manufacturing value added, Asia-Pacific and the Rest of the World (ROW)



Source: (World Bank 2012)

Population was an important driver of growing material use in the 1970s and 1980s (growing from 1.5 billion in 1960 to close to 3 biliion in 1990, up to 4.1 billion today). Since the 1990s consumption has replaced population as the main driver. According to the World Bank (2012), household final consumption expenditure per capita grew from around 200 USD (constant 2000 dollars) in the mid eighties to 500 USD and 900 USD in South Asia and East Asia respectively by 2011. According to the McKinsey Global Institute (2011), India could potentially increase its urban consumption six-fold between 2005 and 2025, and consumption could increase more than sevenfold in China. Increasing incomes lead to more volume and intensity of consumption.

Figure 1:4 Household final consumption expenditure per capita (constant 2000 US$)



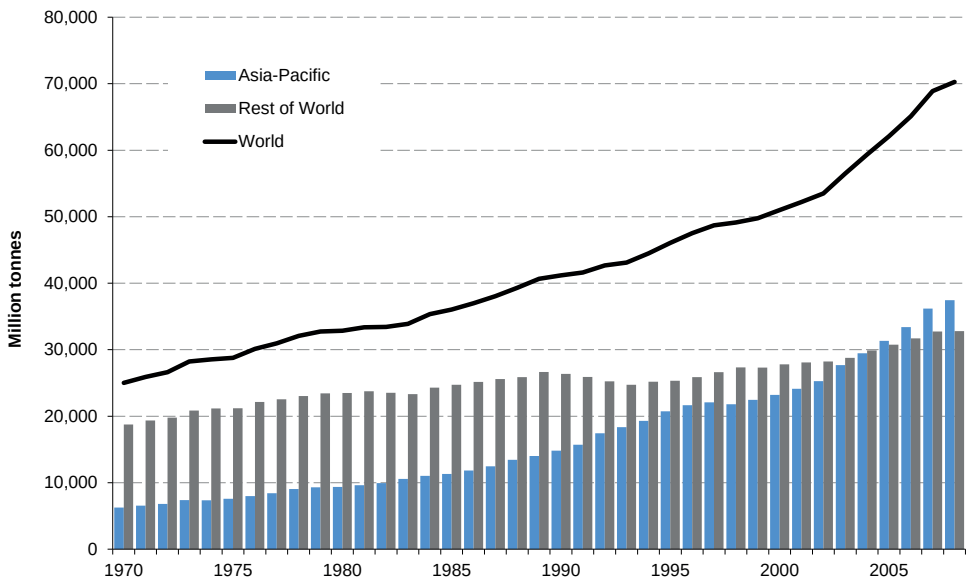
The rise of resource use

The success story of growing human development in Asia and the Pacific has come at a cost, however, and has been 'coupled' with a staggering rise in resource use.

Resources (energy, biomass, minerals, fossil fuels, metals, water and land) are fundamental for the wellbeing of people and the planet. The exponential growth of global resource use since 1900 has made it possible for the human population — and with it the economy — to grow rapidly. However, this level of resource use was largely based on the assumption of limitless resources and overlooked the connections between resource use and environmental impacts. Asia-Pacific has overtaken the rest of the world to become the single largest user of materials. The following trends provide an insight into the dynamics of resource use in the region:

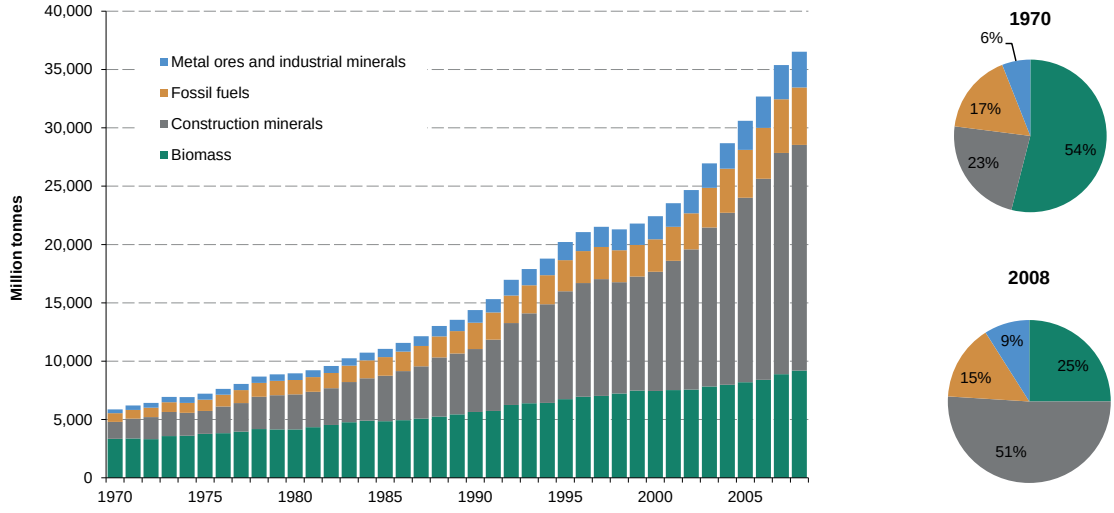
- The use of materials had grown to 32 billion tonnes by 2005, over half of global resource use. On a per capita level, this is a growth from 7.5 tonnes to about 9 tonnes per-capita each year. If unchecked, material use in the region is expected to grow to about 80 billion tonnes by 2050 (UNEP 2011).
- The nature of resource use has also shifted from mainly biomass (over 50% in 1970), to mainly mineral materials (over 70% in 2005). This is important because it signals a transition from a traditional, agricultural and land based economy to an increasingly industrial and urban economy (West & Schandl, 2012).
- Mining and agriculture has grown rapidly in recent decades. While the global extraction grew by 40% from 1985 to 2005, Asia almost doubled its extraction rates.
- The region consumes about one third of global primary energy use (180 EJ out of a global total of 480 EJ in 2005), but has a growth potential to 325 EJ of primary energy use by 2050. More importantly, the primary energy base has shifted to coal and the share of renewable energy in the energy mix has decreased. This was caused by a rapidly increasing demand for electricity fuelling manufacturing infrastructure and household consumption.
- Water use has grown substantially. It had grown to 1.5 peta litres (1 petalitre = 1,000,000,000,000,000 litres) in 2000 equivalent, around about 550,000 litres per capita each year, with agriculture as the largest user accounting for about 80% of all water withdrawals (UNEP 2011).

Figure 1:5 Domestic Material Consumption (DMC) in Asia and the Pacific, the world and the rest of the world, 1970-2008, in million tonnes



Source: (West & Schandl 2012) DMC refers to the apparent consumption of materials, i.e. intermediate and final consumption (DMC = Imports + Domestic Extraction – Exports).

Figure 1:6 The material transition in Asia and the Pacific, DMC by four main material categories, 1970- 2008, in million tonnes



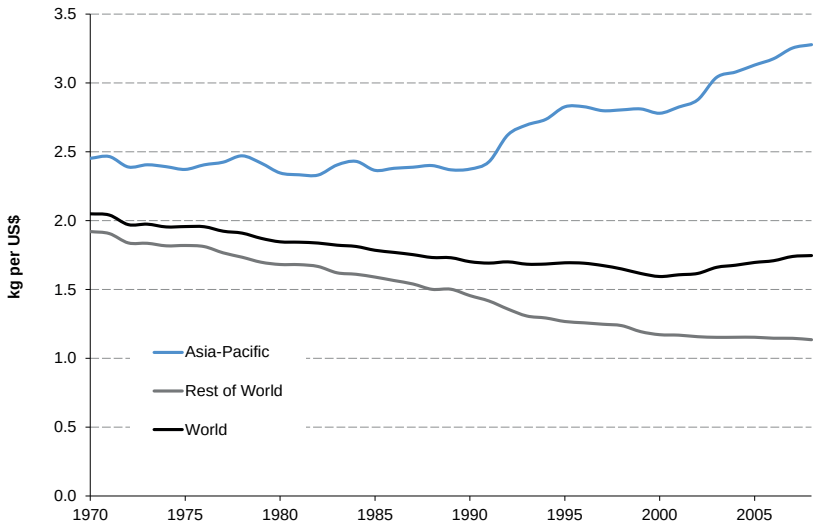
Source: (West & Schandl 2012)

As Asia rapidly became the manufacturing base of the world, regional resource intensity (resource use per dollar) has increased (from 2.5kg/USD in 1970 to almost 3.5kg/USD in 2008, and up to 12kg/USD in some countries (UNEP 2012)). In many cases, production shifted from very material efficient countries such as Japan to less efficient countries such as China and India.

These overall trends in natural resource use have contributed to a new economic context of rising resource prices and have caused a number of temporal shortages of resources critical to production, including some metals and

industrial minerals such as rare earth. These trends are not only concerning because of increasing prices of natural resources, but also may be exacerbated by climate change. The trends are still at their early stages and signs point to massive increases in the future.

Figure 1:7 Material intensity of Asia and the Pacific, the world and the rest of the world, 1970-2008, in kg per US$



Source: (West & Schandl 2012) Material intensity is measured as DMC over GDP (exchange rate based at 2000 prices).

The decline of environmental capacity

One constant throughout these shifts in resource use is the capacity of the receiving environment to absorb the emissions, waste, land use change and impacts of mining. The environmental impacts of consumption and production have kept pace with the rises in resource use, including greenhouse gas emissions (which reached 16 billion tonnes in 2005 and are expected to grow rapidly), acidification and eutrophication of water bodies and soils. There have been severe impacts on forests and biodiversity, which are among the most important ecosystems in the region. This has also lead to reduced ecosystem services and has brought many countries and the region as a whole, much closer to the thresholds of the bio-capacity of their domestic natural systems.

The saying goes, “If you want things to stay as they are, things will have to change” (di Lampeduse 1958). This couldn’t be truer for the environmental quality of the region. Some thresholds are at their limit, therefore the question remains how Asia-Pacific will develop into the future, first and foremost to combat poverty and to meet the needs of its economies, while maintaining a functioning resource base and receiving environment.

The importance of human development and poverty reduction

The main challenge for economic and environmental policy making in Asia-Pacific are the dual objectives of development and environment. Over the last three decades, Asia-Pacific has made remarkable progress in human development and improving the material standard of living of its people. Despite these remarkable developments there remains much to be done in regard to further developing the region, increasing opportunity and living standards for the hundreds of millions of people who still live in poverty and disadvantage. The region will require future economic growth to enable an increasing standard of living for households and to combat poverty, which is still entrenched in many parts of the region.

According to a recent report by the Asian Development Bank (2011) poverty reduction has been significant in the region. Despite the Global Financial Crisis (GFC) an estimated 150 million people exited extreme poverty by 2008. The number of extreme poor was reduced from 903 million in 2005 to 753 million in 2008, which means that the percentage of people living under $1.25 per day has declined to 21.9% from 27.1% in 2005. The economic dynamism of the region has not only enabled a growth in new middle classes with consumption behaviours similar to OECD consumers, but has also considerably contributed to poverty reduction.
Poverty reduction was, however, uneven across countries with particularly China outperforming the rest of the region. In a number of countries the incident of extreme poverty has been on the rise, driven by fast population

growth, with poverty reduction not keeping up. In 2008, India continued to be home of the largest number of the region's poor followed by China, Bangladesh, Indonesia and Pakistan. The GFC seemed to have slowed progress in poverty reduction as numbers for 2009 suggest. The challenge in Asia-Pacific to combat poverty remains large, with two thirds of the world's poor living in this region.

Increasing the eco-efficiency of production in Asia and the Pacific

It is also obvious to many, that while poverty reduction and economic growth are a priority for the region, the future growth model of Asia and the Pacific cannot mimic the historical growth model of today's industrialised countries. It needs to involve considerable innovation for establishing a new industrial system that can fuel prosperity in the region beyond the aggressive resource consumption of the old industrial system. Therefore SCP in the region will be particularly important to balance the socio-economic driving forces with the environmental capacity of the region.

One important aspect of SCP, which has been addressed by academic research and policy efforts since the 1980's, is the potential of cleaner production and greater eco-efficiency of production. Reducing the natural resources used in production as well as the related waste and emissions is both beneficial for the environment and also saves production costs, which makes it an attractive strategy for businesses particularly in the material, energy and emission intensive industries.

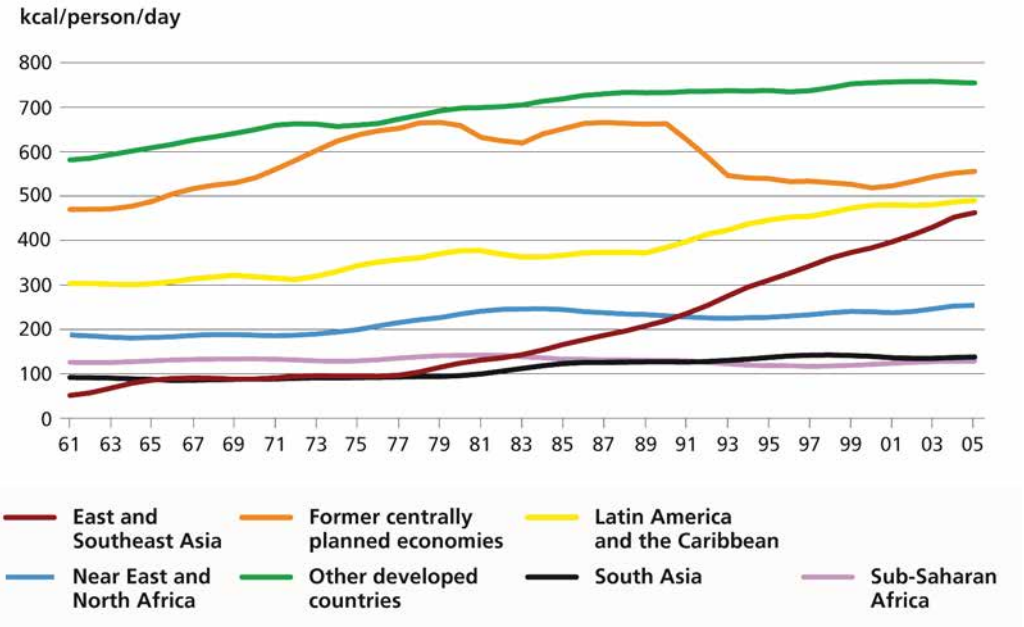
The greatest potential for eco-efficiency often exists in the heavy industry sectors of steel and cement, the building and transport sectors and in agriculture. One example of a production technology is Zeobond cement, which requires 80% less energy to produce than Portland cement (Smith et al. 2009). The building, transport and agricultural sectors also offer large saving potentials especially in the use phase of buildings and for mobility. The saving potential may be as large as 70%-80% for many natural resources without reducing the level of service or comfort (Von Weizsaecker et al., 2009). This offers a window of opportunity for Asia-Pacific. The amount of infrastructure, buildings, roads and manufacturing capacity that will need to be established over the next three decades is considerable, offering a very large potential for investing into cleaner production and green infrastructure. This will require additional investment for lower income countries and redirecting existing investment in emerging economies to SCP and a green economy.

New consumers and sustainable consumption

Sustainable consumption in Asia-Pacific has two important aspects, the need to attend to under-consumption but on the other hand, the rising consumer classes and their very high consumption levels. Lifestyles and consumption patterns of millions of consumers in Asian developing countries are now converging with those of OECD countries. This is particularly the case among younger and well-educated elites. This global consumer class already totalled 1.7 billion people in 2004 (Worldwatch Institute, 2004) of which almost 40% or 680 million lived in Asia.

The consumption patterns of the new consumer classes will result in larger houses and apartments fitted with new appliances, new modes of transport and increasing private car ownership, increased air travel, new diets based on much larger amounts of meat and dairy and a whole range of manufacturing goods. Increases in meat consumption across the region are highlighted in Figure 1:8. There is an important opportunity to guide the transition in consumption in Asia-Pacific towards sustainability through policy settings and frameworks that privilege environmentally friendly and socially just products and services. This can happen through labelling, subsidies and information campaigns, which are all areas in which government intervention will be of great importance.

Figure 1:8 Per capita intake of energy derived from livestock products 1961-2005



Source (FAO 2009)

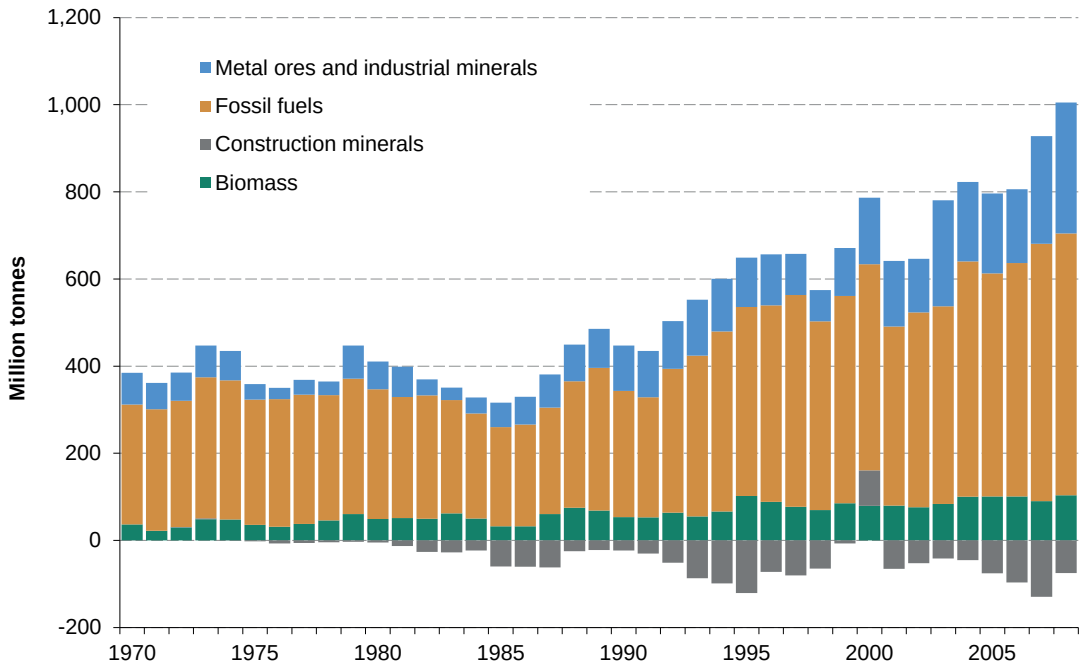
Governments are able to showcase best practice in their own consumption behaviour through green procurement and investment in energy efficient and low material intensity public buildings such as government offices, schools and hospitals as well as public infrastructure for transport and recreation. These are investments, which will greatly pay off in terms of sustainable natural resource use and climate change mitigation.

SCP policies underpinning the future competitiveness of Asia and the Pacific

Asia-Pacific has been the motor of world economic development for the past two decades securing its place as a global centre of manufacturing. The region hosts around two thirds of the world's people and about half of the world's consumers. The region has lifted millions of people out of poverty and continues to grow steadily. The economic transition of Asia-Pacific is happening in a context that former World Bank economist Herman Daly has named 'full world economics' (Daly, 2007). This reflects upon an economic context, in which natural resources and the absorptive capacity of ecosystems have increasingly become the limiting factor in economic growth and human development. While labour is available in abundance, resources will need to be extracted at ever-higher effort and climate change is setting clear limits on emissions. Figure 1:9 shows the changing physcial trade balance in the region, highlighting the increase in the reliance on imports.

In such a new economic context, governments, businesses and households need to care about resource efficiency and change to new ways of producing and consuming, in order to make room for further growth and prosperity. The changing context indicates that environment and development are no longer antagonistic goals but are intrinsically interrelated. Without resource efficiency and innovation for SCP, future prosperity will be increasingly difficult to achieve. Asia-Pacific has a number of advantages in creating a green economy. These include its traditional culture, which is affirmative of sustainability, its people, many of them well educated and ready for innovation and the fact that a lot of the infrastructure required for the future has not yet been established, creating a huge window of opportunity for doing things well. Well-designed policies that guide green economic development, enabled by SCP, may well be a future economic driver which can create competitive advantages in the region.

Figure 1:9 Physical Trade Balance (PTB) for Asia and the Pacific, 1970-2008, in million tonnes



Source: (West & Schandl 2012) A positive PTB value refers to a net importer of materials, a negative PTB value refers to a net exporter of materials.

Box 1:4 What are decoupling and resource efficiency?

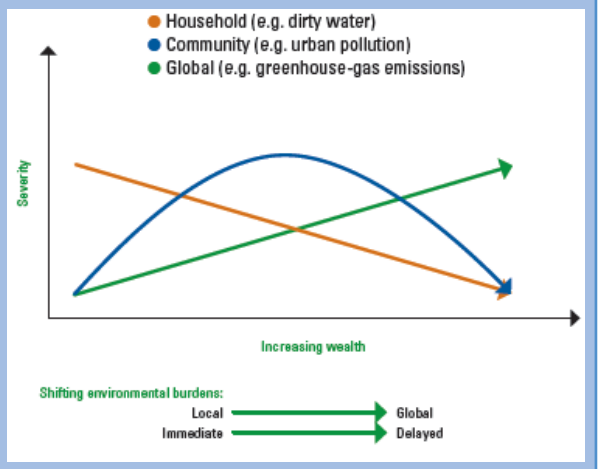
If world population and consumption rates continue according to business as usual, annual global resource extraction could triple from 2000 levels to 140 billion tons in 2050. This scenario would seem to represent an unsustainable future in terms of resource use, emissions and environmental impacts. To address this challenge, experts and decision makers have investigated decoupling as a framework for breaking the links between human well-being and economic growth on the one hand, and escalating resource use and environmental degradation on the other hand. Decoupling means two things: decoupling economic growth from resource consumption ("resource decoupling") and from environmental impacts ("impact decoupling"). This means that resource decoupling efforts should be checked to see that they do not increase environmental impacts. For developing countries with low metabolic rates (see Box 1:6), the foremost priority is to improve levels of material well being and access to services. For these countries, innovative opportunities need to be found to ensure better delivery of services and access to resources in a way that conserves their natural resource base. In this case, resource productivity is an important strategy in addition to resource efficiency. Developed countries with high resource metabolisms will have an abundance of opportunities to restore their resource base, improve the quality of their environment and reduce GHG emissions through more efficient and better use of resources. In this case resource efficiency strategies will be highly effective, and can be complemented by resource productivity.

Decoupling

In general, decoupling means removing the link between two variables. The International Resource Panel often refers to resource decoupling (the delinking of economic growth and resource use) and impact decoupling (the delinking of economic growth and negative environmental impacts). Moreover, decoupling can be relative (e.g. the rate of resource use increase is lower than the rate of economic growth) or absolute (e.g. resource use declines while the economy grows).

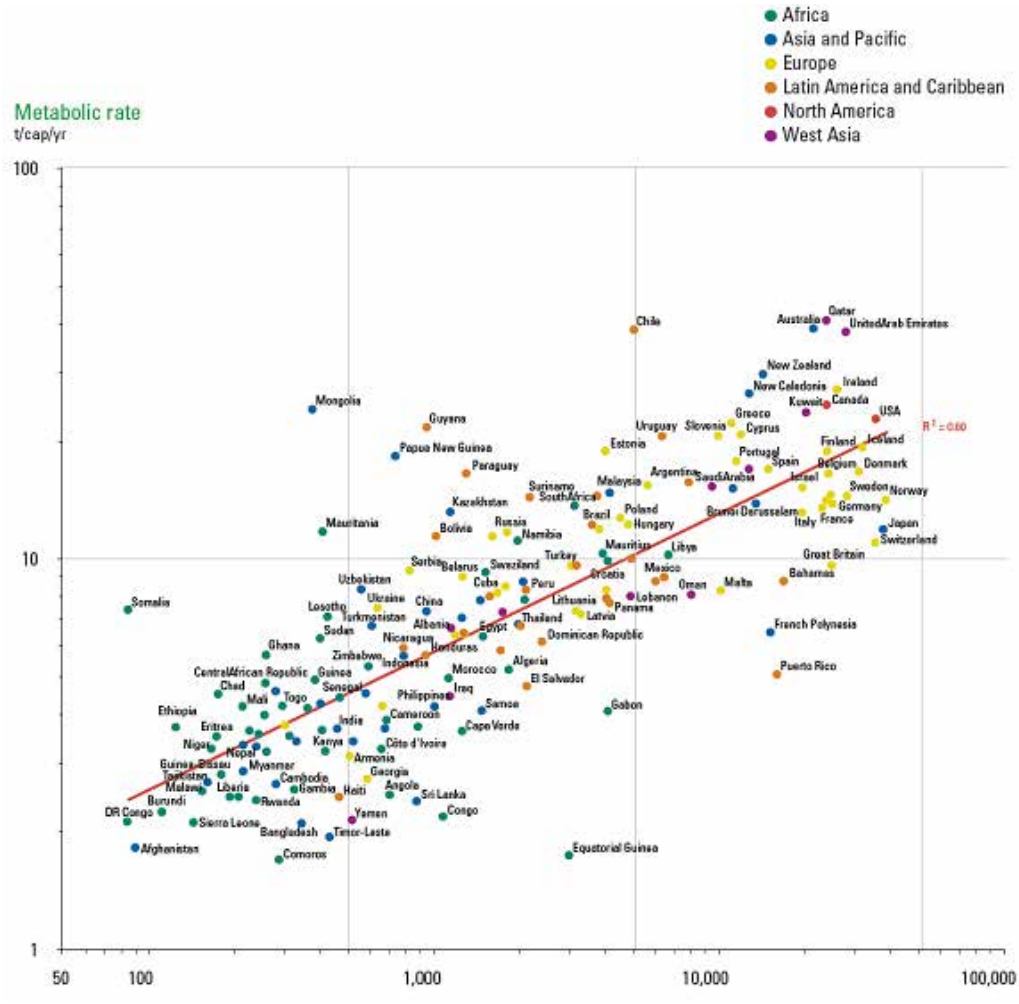
Box 1:5 Why should developing countries care about resource efficiency before they can 'afford' it?

Assumptions about environment and development tend to reflect the hypothesis of the Environmental Kuznets curve. This hypothesis suggests that as economies develop, environmental problems initially increase in line with economic development, before decreasing in later stages of economic development. This has been the excuse behind 'waiting until we can afford it' before acting. Recent studies have suggested that this relationship only relates to community level environmental problems, such as urban air pollution, whereas household level environmental problems only decrease and global environmental problems only increase (see the orange and green curves respectively). The International Resource Panel's most recent report on decoupling has shown that metabolic rates, at least based on latitudinal data, follow the trend of the green line, continually increasing with economic growth. This indicates that it is difficult to reduce the severity of resource use once consumption levels are high, making it reasonable for policy makers to find resource efficient paths of development at earlier levels of economic wealth.



Source: (Environmental Risk Transition Framework, Adapted from Wilkinson et al., cited in UNEP 2011b)

Figure 1:10 The global interrelation between resource use and income (175 countries in the year 2000)



Source: (Steinberger et al., cited in UNEP 2011b)

Box 1:6 Metabolic rates

Metabolic rates can be measured using Domestic Material Consumption (DMC), which is the mass of resources extracted domestically (from mining and agriculture) + products and materials imported - products and materials exported. Figure 1:10 shows the correlation between DMC and GDP, which follows the green continually increasing line in the Environmental Kuznets Curve, indicating it is not an environmental pressure that can easily be reduced once a country reaches higher development levels.

Further reading 1

Green Growth, Resources and the Resilience: Environmental Sustainability in Asia and the Pacific looks at the changing economic context in Asia and the Pacific and the opportunities of green growth in the region. Focussing on the emerging challenges of resources and resilience the publication provides insights into key policy arenas for green growth and up to date regional and national data.

United Nations, Economic and Social Commission for Asia and the Pacific, Asia Development Band & United Nations Environment Programme 2012, *Green Growth, Resources and Resilience Environmental Sustainability in Asia and the Pacific,* Bangkok, United Nations.

Resource Revolution: Meeting the world's energy, materials, food, and water needs is an important report about future global resource demands and the role of efficiency in meeting it. The documents highlights need for policy responses required to address these challenges.

McKinsey Global Institute 2011, Resource Revolution: Meeting the world's energy, materials, food, and water needs. Available from: <http://www.mckinsey.com/features/resource_revolution>. [15 September 2012].

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2 The Fundamentals of SCP

2.1 Linkages between poverty reduction and SCP

2.2 Life-cycle thinking and a systems approach

2 The Fundamentals of SCP

SCP

Key Learning Points

- SCP is a critical element of poverty reduction that needs to be part of a holistic poverty alleviation policy.
- There is no real conflict in priorities between economic development and SCP.
- Developing countries sometimes feel that they are being pressured to show restraint in growth and consumption, which developed countries can more easily afford. However, sustainable economic growth need not be restrained – SCP calls for different growth paths, not curtailed growth.
- Aspirations for a better quality of life by the poor can also be met; consumption need not be restrained, but merely channelled into more sustainable goods and services.
- Life-cycle thinking is one of the most important elements in the SCP approach because it provides the framework for a holistic assessment, and it can be applied to any kind of system.
- While life-cycle thinking is a way of looking at the environmental impact of products from a broad perspective, life-cycle assessment (LCA) is mainly a quantitative methodology for compiling, analysing and generating life-cycle information
- SCP takes a systems approach for sustainability, it means to look at an issue in a broader context. It means trying to address the underlying causes of an identified problem rather than just trying to alleviate its immediate symptoms

This chapter introduces concepts and perspectives that are fundamental to SCP thinking and practice. It addresses some widely held misunderstandings, including that there is a conflict between SCP and poverty alleviation. The need for considering products and services in terms of their complete lifecycle is introduced and explained.

2.1 Linkages between poverty reduction and SCP

Introduction

In classic terms, the objective of SCP is to:

- Conserve natural resources by more efficient use so that human needs can be satisfied without exhausting the world's finite supply of such resources, leaving behind enough for future generations.
- Ensure that the goods and services we produce and consume and the manner in which they are produced, used and discarded does not pollute the planet.

The most pressing issue for developing countries, including those in transition, is poverty alleviation. This remains the single most important of the Millennium Development Goals. Economic growth is thus relatively more important to developing countries and many of their policy makers believe that developed countries, having accomplished a high level of satisfaction of their needs, now wish to suggest frugality and restraint on consumption in the developing world.

From the production standpoint, developed countries have shifted a large number of production activities to developing countries and transitional economies. China, for instance, is considered the "factory to the world". Industrial production necessarily involves some degree of energy consumption and effluent discharge, so developing countries are charged with exponentially increasing GHG emissions and pollution.

Clearly, there has to be some degree of equity. The onus of sustainability must be shared in an equitable manner, with both developing and developed countries contributing their fair share.

Poverty and pollution

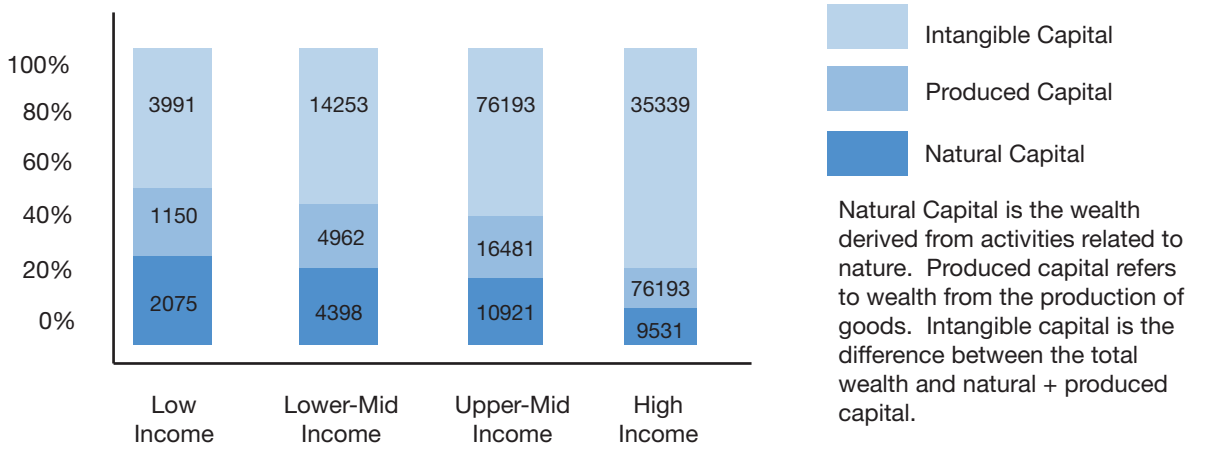
"Poverty is the greatest polluter": this statement is attributed to the former Indian Prime Minister, Indira Gandhi, at a speech at the 1972 Conference on the Human Environment is Stockholm. She theorised that the poor

were forced to pollute by poverty and unequal access to land, setting off a downward spiral where they were impelled to destroy the natural resources on which they depend, thus deepening their poverty (Lean, George, n.d).

While this is undoubtedly true, it must be placed in context. The statement was made in 1972, long before the world became conscious of acceleration in anthropomorphic GHG emissions. The oil crisis of 1973 was perhaps the first shock that set off thinking about conservation of natural resources, and a few years later, ozone depletion came into public consciousness, setting off the alarm about atmospheric pollution. Nevertheless, Mrs Gandhi's statement was probably the first to create a direct link between environmental concerns and poverty alleviation.

It can be readily accepted that the world's poor, even in aggregate, are not leaders in depletion of non-renewable resources. Neither can the poor be held responsible for the major part of the GHG emissions. The culprits are over-consumption by the rich, irrespective of which country they belong to, and the design, production and promotion of plainly unsustainable products.
The impact, however, is greatest on lower income groups, as illustrated in below.

Figure 2:1 Share of income derived from different capital stocks in country groupings



Source: (Ferreira, Hamilton & World Bank 2006)

The poor depend much more on nature for their livelihoods than the rich. Thus "natural" changes – for instance those brought about by climate change due to man-made activities – are likely to hit the poor much harder than the rich, although ultimately they will affect all.

This underscores the need for countries to move towards a green economy – by investing in natural capital as a source of economic growth. Table 2:1, below illustrates the link between poverty alleviation and wise management of natural resources and wise management of ecosystem resources.

Table 2:1 Poverty alleviation and natural resources

Natural-resource dependent sectors and Ecosystem services	Brazil	Indonesia	India
Original share of GDP (%): agriculture, forestry, fisheries	6%	11%	17%
Adjusted share of GDP (%): including non market/ESS	17%	15%	20%
Share of ESS/non market goods of total income of the poor (%)	90%	75%	47%

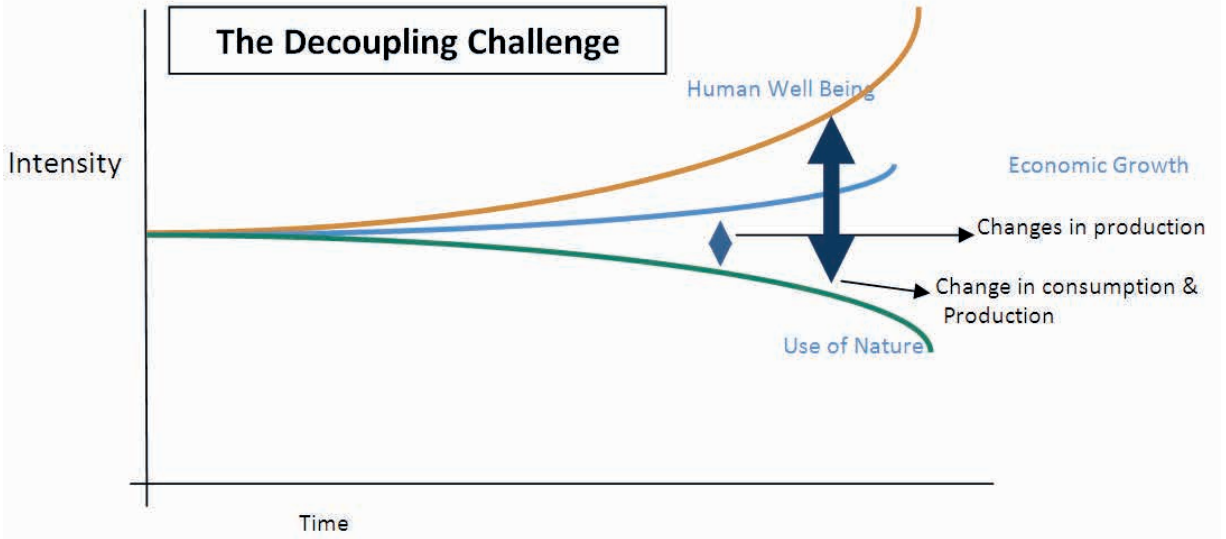
Source: (TEEB 2010)

As can be seen, eco-system services and other 'non-market' goods can account for as much as 47-90% of the so-called "GDP of the poor", highlighting their vulnerability.

Needs and aspirations

It is not only the basic needs of the poor which have to be met; it is also essential that their aspirations be fulfilled. The desire to continuously improve the quality of life is inherent – Abraham Maslow's theory of need hierarchy holds good even today. The challenge therefore, is how to de-couple the needs and aspirations from the effects on the environment, as illustrated in Figure 2:2.

Figure 2:2 The decoupling challenge



Interpolated from: (UNEP 2011)

Sustainable practices in both consumption and production can permit the fulfilment of both needs and wants while minimising the effect on nature, i.e. with the minimum resource depletion and with minimum pollution. Pressure to improve sustainable practices can lead to employment generation and stimulate innovation while simultaneously protecting existing sources of income. It should be noted, however, that there are multiple reasons for continued poverty, including lack of education, poor healthcare, political crises, poor access to credit and the like. SCP alone cannot address all the causes of poverty; the solution lies in a holistic poverty alleviation programme which includes SCP as one of the more critical elements.

SCP Practices Contributing to Poverty Reduction:

There are a number of initiatives which countries can take in their search for increased sustainability in consumption and production. Many governments are adopting or have adopted sector-specific policies such as Sustainable Public Procurement (Chapter 9), on codes and standards for Sustainable Cities (Chapter 8) or Sustainable Tourism (Chapter 10). Others have formulated policies which mandate land usage, waste disposal, effluent discharge, energy efficiency, minimum wages, working conditions and the like and have implemented these through legislation, fiscal incentives or a combination of both.

Simultaneously there are pressures on the private sector to exhibit a greater sense of Corporate Social and Environmental Responsibility while individuals are equipped with tools such as Ecolabels to enable them to make the right/sustainable choice.

Most of these initiatives have been tried and stood the test of time. Chapter 9 on Sustainable Public Procurement provides examples of reductions in CO_2 emissions in Europe and Asia and shows how a planned programme of increasing sustainability in public buying can lead to job creation, innovation and improved efficiency. "Poverty Alleviation Through Sustainable Tourism Development", a UNESCAP Publication (2003) lays out how sustainable practices in the tourism sector can and do lead to a reduction in poverty. Virtually every sector, in every country will have success stories to tell of how SCP has helped in reducing poverty. Some of the SCP policy opportunities that can lead to a reduction in poverty are discussed further in Part B of the manual.

In summary, therefore, the link between SCP and poverty alleviation lies in:

- Reduced demand for depleting resources and therefore increased availability.
- Reduced effect on the world's climate - and thus protection of the livelihoods of those dependent on nature.
- Improved health – once again due to reduction in aberrations in the climate, and also due to lower levels of pollution of air, water and the earth.
- Improved efficiency in the production of basic goods and services – and consequently improved affordability for the poor.
- Increased job creation due to newly created products and services and new methods of production.

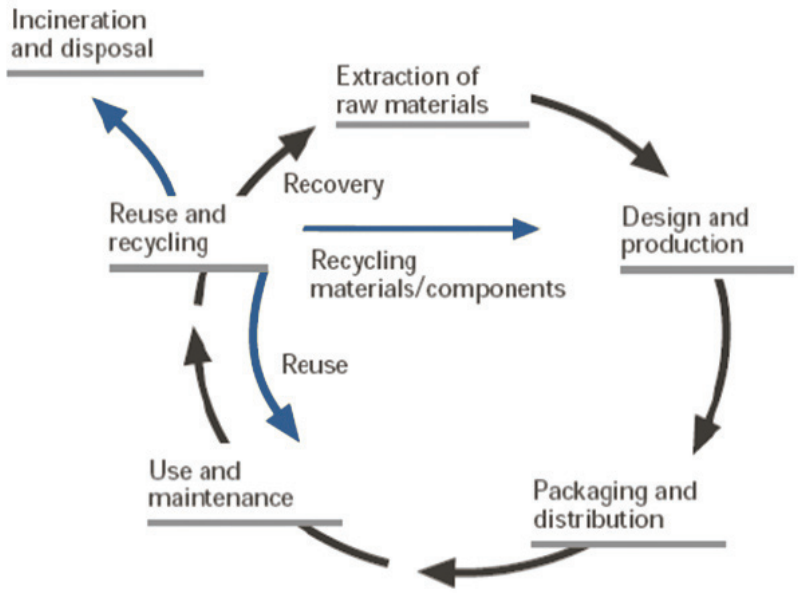
2.2 Life-cycle thinking and a systems approach

The significance of life-cycle thinking

Modern urban lifestyles involve the daily use of a large number of products (including services) but few people reflect over how these products have been produced and what environmental impacts have been caused along the way. In addition, few of us think of what will happen to the products we are currently using when we don't need them anymore – how they can be reused, recycled, or taken care of safely as waste. However, when assessing the environmental performance of a product it is essential to use a life-cycle perspective and consider all impacts associated with that product from "cradle to grave", including consumption of natural resources as well as emission of environmental pollutants. This means to consider not only the environmental impacts of the product itself during its use phase, such as the energy consumption of a lap-top computer, but also the resource consumption and pollution associated with all stages of production as well as end-of-life management. In the case of a lap-top computer, large amounts of resources are consumed during the production stages – in fact, many times more than the weight of the computer itself – and if the recycling is not done properly there could be significant harm to humans and the environment.

Most products and services are part of increasingly complex industrial networks involving resource extraction and refining, component manufacturing, final assembly, distribution, retail, use and recycling and waste management. All of these processes consume energy and other resources, and most of them emit pollutants to the environment. Figure 2:3 shows in a schematic manner the different stages of a product life-cycle.

Figure 2:3 A schematic product life-cycle covering all the major phases from raw materials extraction to end-of-life management



Source: (UNEP/SETAC 2005)

A life-cycle perspective can be applied to all kinds of technical systems, not only regular products. Many studies have been conducted of municipal infrastructure, such as wastewater treatment systems and solid waste management systems. Such studies can be of particular interest for governments since they often play a central role in decisions on investments in this kind of infrastructure.

A life-cycle perspective can reveal what stage of a product's life-cycle is causing the largest environmental burden and thereby help in guiding improvement efforts. For example, most of the environmental impacts of automobiles are caused during the use phase (emissions of carbon dioxide and other pollutants) while for most food products the environmental impacts are mainly caused during production. Effective policy responses need to take such differences into account.

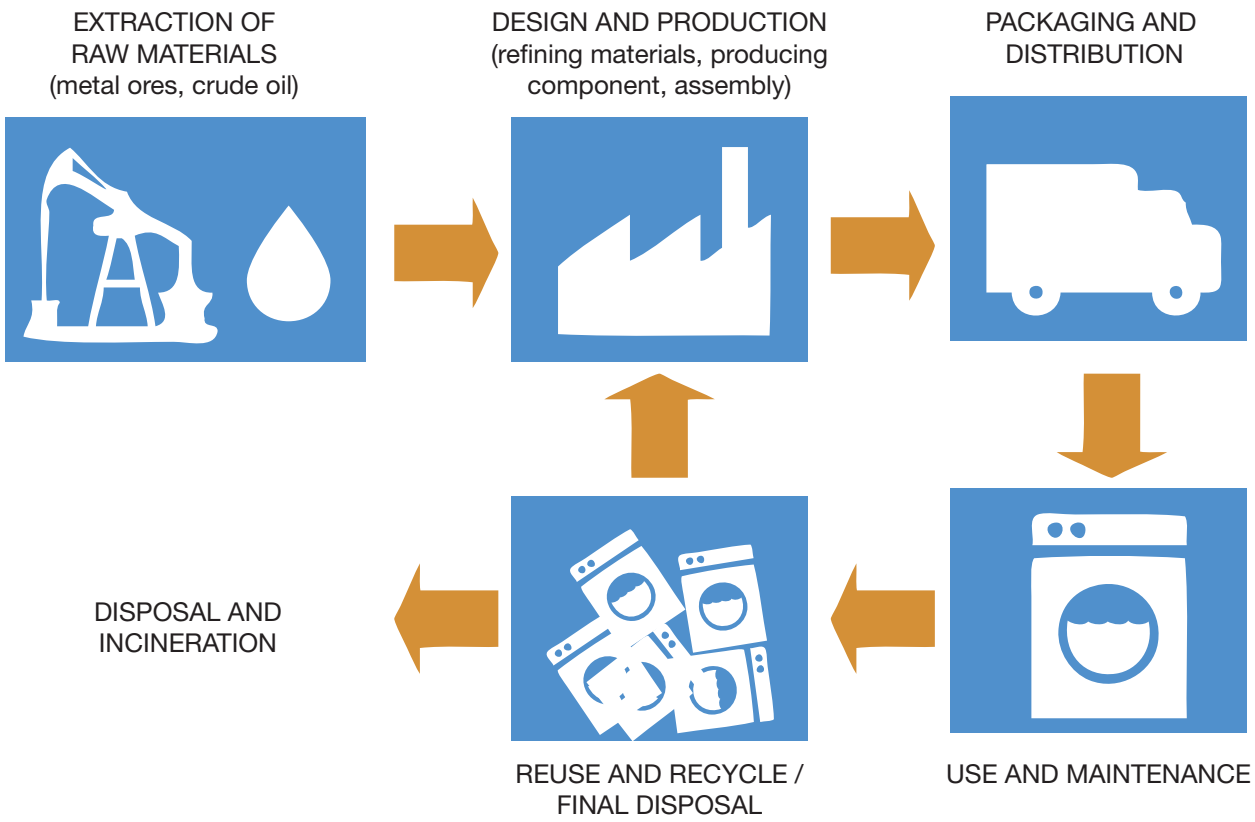
Box 2:1 Life cycle impacts of common products

A life-cycle perspective will often reveal surprising facts about the environmental impacts associated with products. For example, few consumers are aware of the huge amounts of water needed to produce cotton. Scientific studies have calculated that the production of one pair of jeans requires around 8000 litres of water (Water Footprint Network, 2012). Few people realise that when buying a pair of new jeans they are in fact using up as much water as they would normally be drinking over a period of almost 11 years (assuming that an average person drinks two litres of water per day). Similar calculations show for example that the production of one cup of coffee requires 130 litres of water (Water Footprint Network, 2012). Few couples that are getting married know that 4 tonnes of rock had to be mined in order to provide the 10 grams of gold needed to make two plain wedding rings.

Other studies have investigated the greenhouse gas emissions caused by food production and found that a person's climate impacts can differ quite significantly depending on his or her dietary habits. In general, high consumption of meat (especially beef) has a large climate impact while a vegetarian diet based on seasonal products grown locally is the most climate-friendly. Since food production is resource intensive, and treatment of organic waste is generating greenhouse gases, waste of food is a major loss for society. For example, in the UK it has been estimated that the environmental benefit of reducing food waste from households to zero would be equivalent to reducing the number of cars by 20 per cent.

Life-cycle thinking can also help in identifying when there is a risk for burden shifting, that is when a solution to a problem at one stage of the life-cycle is causing increasing problems somewhere else. The risk for burden shifting can be illustrated by the case of an energy efficient product that requires more materials for its production than a conventional option with lower energy efficiency. If the energy needed for extracting and processing the extra materials is taken into consideration, the more efficient product may not be using less energy over its life-cycle. It is only by considering the whole life-cycle that it's possible to say whether there is a risk for significant burden shifting. It is of course essential that public policy makers are cognizant of when a policy intervention runs the risk of shifting environmental burdens rather than reducing overall environmental impacts.

Figure 2:4 Life cycle of a washing machine

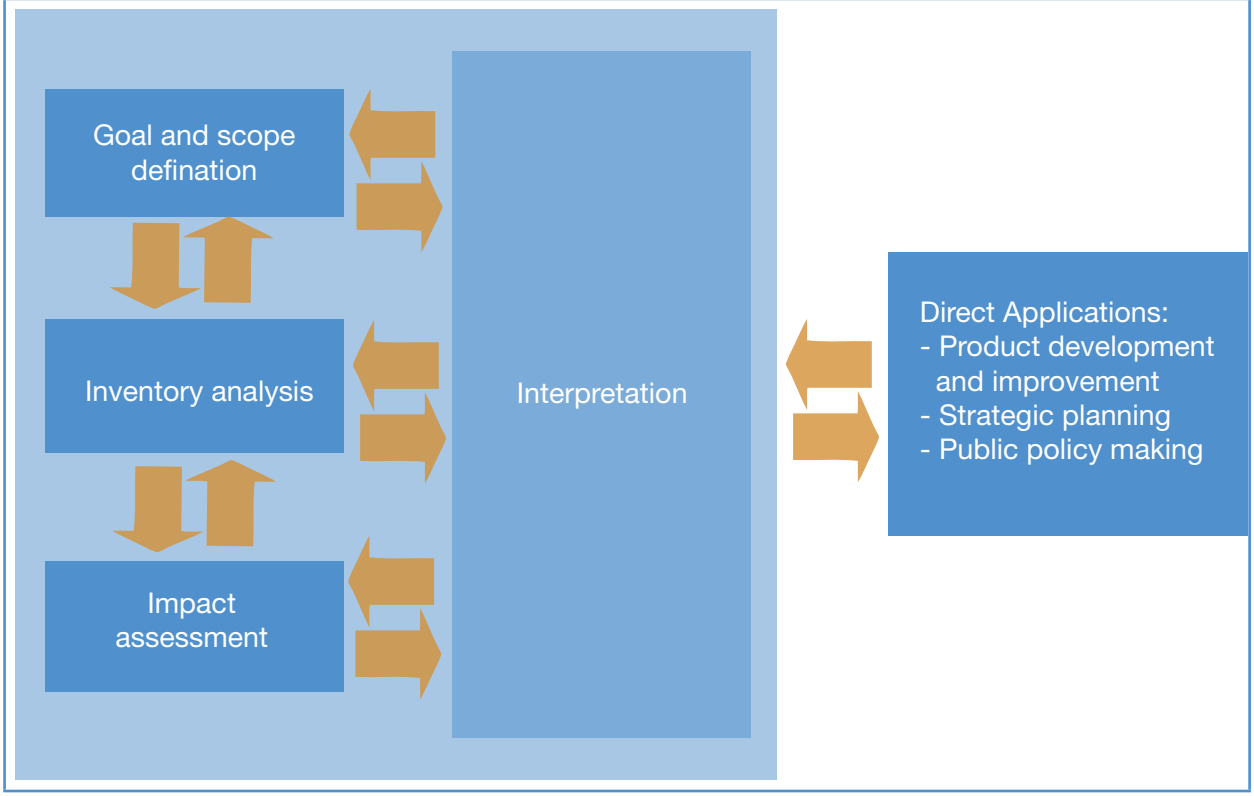


Understanding Life-cycle assessment

As explained above, life-cycle thinking is a way of looking at the environmental impact of products from a broad perspective. This can be done in a qualitative manner, for example by simply discussing what kinds of burden shifting could occur from a certain design change or from the introduction of a new public policy. In contrast, life-cycle assessment (LCA) is a mainly quantitative methodology for compiling, analysing and generating life-cycle information. There are generally four main activities in an LCA study:

1. **Goal and Scope Definition**, where the objective and boundaries of the study are decided
2. **Inventory Analysis**, where a model of the life-cycle is made and where data on environmental emissions or resource consumption of different processes in the life-cycle are collected or calculated.
3. **Impact Assessment**, where the impact on the environment is assessed
4. **Interpretation**, where significant issues related with the studied product are identified and conclusions are drawn. Sensitivity analyses, identification of significant data gaps and major uncertainties can also be included.

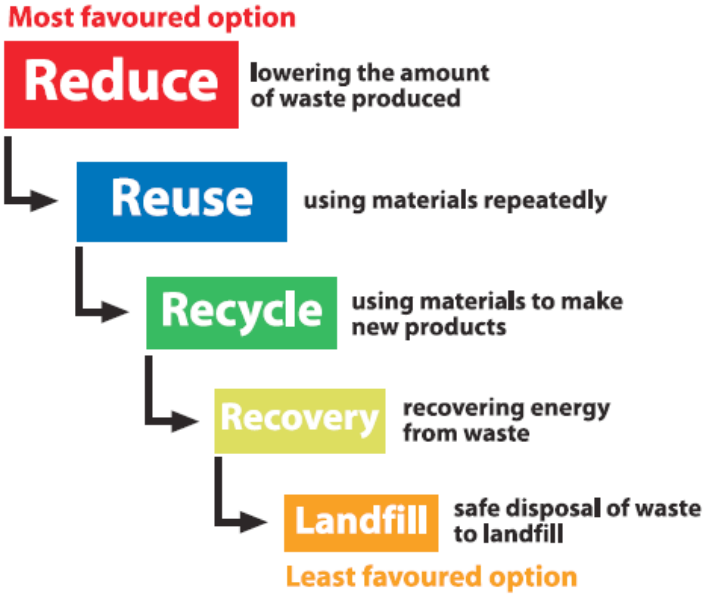
Figure 2:5 LCA stages according to ISO 14040



An LCA can have a narrow focus on one single kind of impact, such as greenhouse gas emissions. This can be the case for example in studies to support carbon footprint labelling. However, in many cases, studies aim to be comprehensive and therefore include a very large number of resources and pollutants. A technique often used for dealing with this complexity is to group together all pollutants that cause similar kinds of harm, for example those that are toxic to humans, those that are related with climate change and those that can lead to eutrophication. Special factors are then used for converting the effect of different substances into a common unit. For example, all gases that contribute to climate change are converted into carbon dioxide equivalents. The results of these calculations are often shown in the form of an environmental profile showing how a certain product (and often some options to this product) contributes to a number of environmental problems.

Comprehensive LCAs often require large amounts of data and take a fairly long time to conduct. It is therefore hardly surprising that most LCAs have been conducted by large companies, industry federations and academic institutions. However, as experiences of conducting such studies in different sectors and for different types of products have grown, an increasing amount of life-cycle information has become available also to other actor groups. Streamlined LCA approaches with lower data requirements have been developed. Databases have been established, thereby considerably reducing the time needed to conduct a study. A large number of LCAs have been made public, making it possible to conduct reviews analysing what earlier studies have concluded and what factors may have caused differences in results or conclusions. Based on the knowledge generated in a large number of independent studies it has also been possible to develop rules of thumb to help decision making. The EU waste hierarchy (Figure 2:5) is an example of such a rule – it ranks a number of waste management options from the most favoured option (waste reduction) to the least favoured option (landfill disposal). A large number of LCAs have basically confirmed that the waste hierarchy provides a sound basis for selecting environmentally beneficial options. There are cases where for example recycling has been found to generate higher environmental impacts than energy recovery or landfill disposal, but these are to be regarded as exceptions.

Figure 2:6 The waste hierarchy – an example of a rule of thumb based on life-cycle thinking



Source: (Waste Aware Business n.d.)

Since the late 1980s a number of academic institutions, governments and private companies have been engaged in developing methods and tools for LCA. These efforts have resulted among other things in the publication of a number of guidelines, such as the one published by the European commission in 2010 (EC 2010) and textbooks, such as The Hitch Hiker's Guide to LCA (Bauman and Tillman 2004). A number of databases and various software tools have also been established in order to further facilitate LCA studies – some of them on a commercial basis, others based on academic or governmental initiatives. A global community of researches and practitioners of LCA has also emerged, and in some countries there are national centres or networks – often involving academia and business as well as government. An example in Asia is the Thai LCA network (http://www.thailca.net/), which has existed since 2001 and involves a large number of partners. One of the key activities of this network is the development of a national database of life-cycle information. A series of international standards – the ISO 14040 series – has also been developed. These standards define among other things a common terminology, a systematic procedure and reporting requirements. At the global level, UNEP has been active in awareness raising and capacity development, especially in collaboration with the scientific association SETAC (Society for Environmental Toxicology and Chemistry) through the UNEP/SETAC Lifecycle Initiative. Since 1996 there is also a scientific journal devoted entirely to the topic of LCA (The International Journal of Life Cycle Assessment) and a number of international conferences on different aspects of LCA are being held at regular intervals.

LCA has traditionally focused only on environmental aspects, but in recent years there has been a growing interest in conducting similar studies including also the social dimension of sustainability. Environmental impacts – consumption of resources and emission of pollutants – are only one aspect of sustainable products. Social aspects, such as decent salaries and proper worker protection, are receiving increasing attention and attempts have been made to include such aspects in life-cycle studies in a systematic fashion. A recently published report from the UNEP/SETAC Life Cycle Initiative (2011) takes stock of emerging methods for such expanded sustainability assessments and provides a number of useful case studies. It includes cases showing how the methodology can be applied to computers and mining. The cases illustrate how the assessment of social aspects can highlight inappropriate labour conditions both upstream in supply chains and downstream in recycling. Since responsible consumers may wish to avoid products that have been produced under poor social conditions, or that generate hazards and social problems at end-of-life, it is important that policy makers work to increase the transparency of product life-cycles and require the private sector to improve access to information on environmental as well as social aspects from a life-cycle perspective.

LCA in developing countries

A challenge frequently faced when conducting LCAs in developing countries is that SMEs play a very significant role in the economy. Collecting data on resource consumption and emissions of environmental pollutants from such small enterprises often turns out to be difficult. Studies will therefore in many cases have to rely on guesses and rough estimations. If data is very uncertain, it can be a good idea to use a scenario approach and make calculations based on both best-case and worst-case assumptions. If it turns out that data from a certain production process is having a large influence on the overall conclusions of a study, and the best-case and worst-case assumptions lead to different overall results, it's an indication that it might be worth spending more efforts to establish correct and representative data.

A systems approach to sustainability

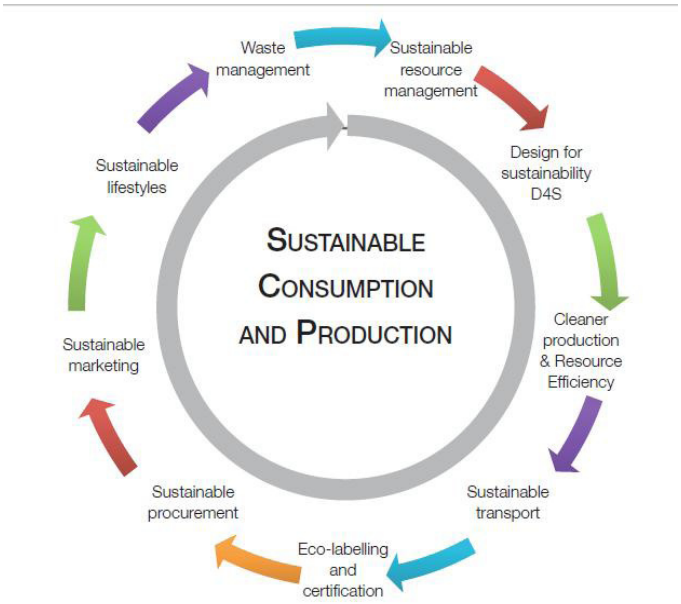
It is possible to reduce the environmental impacts of most products quite substantially through design changes. To some extent this is already happening and LCA studies are providing valuable input to these improvement efforts. However, there is a limit to what can be achieved through an approach that basically takes existing consumption patterns for given and only concentrates of reducing the impacts of this consumption. Given the rapidly escalating consumption of natural resources and the increasing emission of greenhouse gases there is a need also for approaches that explore radically different ways of providing utility or wellbeing to citizens/consumers; we can call such changes systems innovations.

Air quality is a big issue in most cities in Asia, but the strategy for making improvements can be very different. Some strategies are more systems oriented and therefore more likely to be able to address the root causes. We can distinguish between three principally different ways of addressing the issue: 1) improve the environmental performance of vehicles, for example by introducing and enforcing emission standards for cars, 2) shift from modes of transportation with high environmental impacts, such as cars, to those with lower impacts, and 3) reduce the need for transportation and mobility, for example through improved city planning and zoning. Strategy number one is a kind of technical fix that can be made relatively easily. In fact, most countries in the Asia-Pacific region have emission regulations for vehicles in place. However, even so, the air in many cities remains highly polluted and the resulting negative impact on human health is considerable. In contrast, strategies number two and three are more systemic in nature and address the underlying drivers of the problem. By addressing the underlying drivers they can also generate additional social benefits, for example: increased use of public transportation reduces not only emissions but also congestion, reduced need for long-distance work commuting leads to shorter commuting time and potentially to more leisure time. These three strategies are of course not exclusive – in order to improve air quality substantially, governments will most likely have to pursue all three of them.

In essence, taking a systems approach means to look at an issue in a broader context. It means trying to address the underlying causes of an identified problem rather than just trying to alleviate its immediate symptoms. It also means being aware of, and trying to avoid, any burden shifting that may occur, i.e. understanding the side-effects of a proposed solution. Biofuels offer a good example where such burden shifting can be significant. While it has been shown that certain kinds of biofuels can reduce emissions of greenhouse gases if they replace fossil fuels, it has also been shown that large scale expansion of biofuels could lead to reduced supply of food crops and feed crops and thereby result in increasing food prices. In order for governments to be able to promote sustainable development it is important that such systemic side-effects are identified at an early stage in the policy process. It is also important that credible science-based methods are used for quantifying such side-effects to the extent possible. However, at the end of the day, the assessment of whether to implement a certain policy or not remains a political decision. LCAs and other systems-oriented studies can make such decisions better informed about the pros and cons of different policy options and the possible trade-offs faced, but the studies can never replace political judgment.

Figure 2:7 Holistic systems approach to SCP

The below diagram visually represents the holistic systems approach to SCP. It demonstrates some of the many opportunities for intervention towards SCP throughout the life cycle of a product or service.



Box 2.2: Complex networks and multiple impacts – challenges for life-cycle thinking

In many cases, the processes that are part of a product life-cycle are spread out geographically – as a result of globalisation such processes are often located even on different continents. Due to the complexity of these networks – the many stages typically involved, the large number of materials and components that are often used in a single product, and the geographic dispersion of the production and end-of-life treatment processes – it is extremely difficult for consumers to understand the full environmental impact of products and of available options. Electronic products and cars are examples of complex products with highly globalised supply chains, but also many other consumer products, such as food, clothing and apparel and furniture are increasingly traded across borders. Consumers who seek to understand the social conditions and environmental impacts in such global supply networks will usually have a hard time finding the information they would like to see. Governments are facing similar challenges when developing guidelines for green public procurement and when designing regulations and other policy instruments intended to shift patterns of consumption and production.

In addition, environmental impacts are not one-dimensional. The examples provided so far in this chapter have mostly discussed cases where only one kind of environmental impact, such as water or energy consumption or greenhouse gas emissions, has been of concern. However, in reality, products can impact the environment in many different ways such as through toxic releases, greenhouse gas emissions and nutrient discharges to water. A comprehensive view of products' environmental impacts requires that all significant kinds of such impacts be considered.

Why it is important to engage the private sector?

Most products and services are provided by the private sector. Businesses therefore play a pivotal role in society's shift to SCP. While consumers typically have limited knowledge on the full life-cycles of the products they buy, producers are in a much better position to apply a life-cycle perspective. At least medium sized and large companies have capacity to scrutinise their value chains from a sustainability perspective, to compile relevant data, to engage with actors upstream (suppliers) and downstream (waste managers and recyclers) and to initiate improvements. Given the central role played by the private sector in managing product life-cycles, policy makers need to encourage and incentivise companies to adopt a life-cycle perspective.

For the private sector, taking a life-cycle perspective means to look at their activities in a broader context. Life-cycle thinking means to investigate the sustainability performance in the supply chains, not only of the direct suppliers but also several steps upstream. It means considering impacts caused after the product has been sold and when it eventually breaks or becomes obsolete. Companies that take a life-cycle perspective acknowledge that they have a certain responsibility for the total impacts caused throughout the product life-cycle. They are also in a sense acknowledging that they are in a position where they can influence the environmental impacts from the whole life-cycle through the way they design their products and through their procurement decisions. Companies that take a strategic approach to sustainability are usually very systematic in the way they investigate the life-cycles of their products and search for improvement opportunities. They are also typically good at communicating these improvements to the market and at translating their sustainability efforts into competitive advantages.

Box 2:3 Private sector opportunities using life cycle thinking

Producers of laundry detergents were quite early out in conducting LCAs in order to see how their products could be reformulated for lower environmental impacts. It was soon found that a very significant environmental aspect of clothes washing is the energy consumption for water heating. Based on this insight, the manufacturers developed new series of detergents that would be effective at lower temperatures. This is a good example of a case where the producers saw their product as part of a larger system and explored both how the environmental impact of that larger system could be reduced and what role their particular product could play in such improvements. By using life-cycle thinking to redesign their product they reduced the life-cycle environmental impact and at the same time managed to save money for their customers.

Further reading 2

Growth, Poverty and the Environment is an excellent essay focussing on the links between growth, poverty reduction and environmental sustainability. It can be found in the 'Global Monitoring Report' 2007, assessing the contributions of countries and international financial institutions towards achieving the Millennium Development Goals.

The World Bank 2007, *Global Monitoring Report 2007*, The World Bank, Washington.

Stern Review Report on the Economics of Climate Change clearly establishes how climate change caused by human activities will first and foremost affect the poor.

Stern, N 2006, *Stern Review Report on the Economics of Climate Change*, Cambridge University Press, UK.

Cradle to cradle: Remaking the way we make things explains why most products in modern society need to be redesigned from a life-cycle perspective. It provides a number of examples of how this can be done. The title comes from the idea that it is not enough to address products' environmental performance from "cradle to grave", from extraction of natural resources to waste disposal, but that we need to design products for circular use of materials. The book is mainly written for the private sector, but it contains lots of food for thought also for government employees, especially those who are interested in industrial development and sustainable use of materials.

McDonough, W & Braungart, M 2002, *Cradle to cradle: Remaking the way we make things*, North Point Press.

The story of stuff project website contains a number of valuable resources for those who wish to learn about life-cycle thinking and how it can be applied in practice. In addition to written documents, the site also contains several entertaining but fact-filled short movies and podcasts. The content is easy to understand and the resources on the site are therefore very suitable for using in training sessions.

The Story of Stuff Project n.d., *The Story of Stuff Project*, Available from: <http://www.storyofstuff.org/>. [September 15 2012].

Towards a life cycle sustainability assessment: making informed choices on products provides a state-of-the-art introduction to Life Cycle Assessment (LCA). It covers both traditional LCA, which only analyses products' environmental impacts, and new developments like Life Cycle Costing (LCC) and Social LCA. Social LCA uses a methodology similar to environmental LCA but focuses on practices that are socially unsustainable, such as dangerous and unfair working conditions and human rights violations. The report is written by a group of leading scholars in the field of LCA, but it is very accessible also for non-experts.

United Nations Environment Programme 2011. *Towards a life cycle sustainability assessment: making informed choices on products*, UNEP, Paris.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3 Policy Development

3.1 The policy cycle

3.2 Policy tools and instruments for SCP

3 Policy Development

Key Learning Points

- The policy cycle has four main stages, problem framing, policy framing, policy implementation and monitoring and evaluation.
- Successful policy requires coordination, integration and institutional change.
- Four groups of policy tools exist.
- These tools can be combined into a *policy mix* to create more effective policy packages towards SCP.
- Participation, transparency and accountability and key to successful policy.
- Checklists and frameworks for policy analysis are included.

This chapter begins with an introduction to the policy cycle, specifically geared towards SCP policy. It provides a general overview of policy tools and provides details on policy approaches and tools of particular relevance to SCP. The section emphasises how policy tools in many cases become more effective when introduced as well designed policy-packages that provide support for more sustainable practices while at the same time discouraging less sustainable products, services and behaviours.

3.1 The policy cycle

Introduction

Good knowledge of the characteristics of the policy cycle will be very useful for policy makers and practitioners in designing and implementing successful SCP policies. This chapter provides an overview of the policy cycle (Dovers 2005) in an idealised way. In practice, the sequencing may look quite different, but all elements are of equal importance if SCP policy objectives are to be achieved. The 4 main stages of the policy cycle are distinguished including:

1. Problem framing
2. Policy framing
3. Policy implementation
4. Monitoring and evaluation of policies

Figure 3:1 The policy cycle

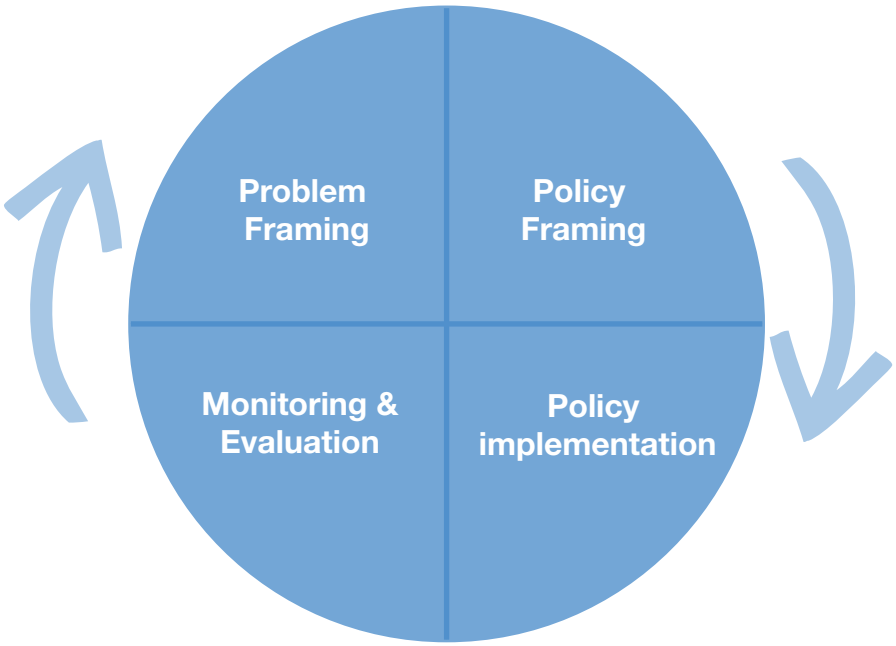


Table 3:1 identifies a number of key steps for each stage of the policy cycle that should be considered to achieve good outcomes in policy making.

Table 3:1 The four stages of the SCP policy cycle

Stage in the policy process	Steps to be taken in each stage
Problem framing: The policy community and general public debate the issues related to SCP, gather information and agree on the nature of a policy problem.	Discussion and the identification of relevant social goals Identification and monitoring of topicality (public concern) Identification of environmental degradation and social inequality Understanding of underlying causes of environmental degradation and social inequality Assessment of risk, uncertainty and ignorance Assessment of existing policy and institutional settings Definition, framing and scaling of policy problems
Policy framing: Guiding policy principles are identified, a policy position is developed and policy goals are defined.	Development of guiding policy principles Construction of general policy statement Definition of measurable policy goals
Policy implementation: Policy instruments are selected, resources allocated, communication and enforcement activities undertaken and monitoring mechanisms established.	Selection of policy instruments and options Planning of implementation Planning of communication, education and information strategies Progression of statutory, institutional and resourcing requirements Establishment of enforcement and compliance mechanisms Establishment of policy monitoring mechanisms
Policy monitoring and evaluation: Ongoing monitoring and evaluation of a policy are undertaken to enable learning and enhance performance.	Ongoing policy monitoring and routine data capture Mandated evaluation and review process Extension, adaptation or cessation of policy and/or goals

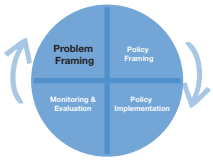
The four main stages are described in greater detail in the following section, to provide guidance for policy makers and practitioners for planning SCP policies and ensuring successful implementation.

Policy and institutional challenges

SCP is still a relatively new policy domain and hence there is limited knowledge about the institutional requirements for enabling such policies. While policy makers have gained considerable experience about eco-efficiency and cleaner production policies, particularly policies in areas where end-of-the-pipe technologies were available, this is not the case for broader transformational policies and for policies that wish to deal with over-consumption or under-consumption. SCP policies need to emphasise time frames beyond the electoral cycle and require balancing of short-term versus long-term goals, sometimes even generational timeframes. Many SCP problems are of a global nature due to the increasingly global nature of production and consumption and product life cycles, however the main institutions are set up for dealing with national or sub-national issues. SCP policies force the integration of economic, environmental and social factors and therefore require the close collaboration of different agencies. The experience in cross-agency collaboration, especially horizontal collaboration, is often quite limited.

SCP policies profit from a large amount of information and from collaboration between science and policy. In the case of incomplete scientific knowledge they have to rely on precaution to avoid undesired consequences, which is not always easy to argue due to a lack of tradition in precautionary policy approaches. SCP policies require significant effort to encourage the participation of interested or affected members of the larger community, which needs to be enabled through well-designed engagement processes.

Finally, SCP addresses policy problems that require innovative policy approaches and sets of policy instruments that work together to achieve the goal of SCP. All this requires tremendous effort in institutional development, capacity building and human resource development. This needs to be recognised from the outset and success will depend on proper resourcing and technical training.



The problem framing phase

The first phase in the policy cycle seeks agreement on the nature of the SCP policy problem. SCP policies are characterised by the complexity of the issues involved and the plurality of values held by different groups in society. In the case of SCP, it is difficult to agree on what needs to be done and by whom. In other words, policy makers need to expect a high level of contestation. In many countries of Asia-Pacific the development objectives and the need to increase material standards of living and alleviate poverty are so omnipresent, that the need for sustainability, enabled by sustainable consumption and production is not widely shared and often limited to urban and policy elites. The need for SCP, however, is not well linked to the every-day life experience of people and it should not wrongly be assumed that there would be broad societal agreement about the necessity of SCP.

If SCP policy interventions are to be effective, in the sense of not attracting widespread criticism and non-compliance, then policy makers and government agencies need to have a good understanding of community opinion. It is essential to understand what society thinks about SCP problems and what kind of information the general public would need to appreciate the importance of SCP for the development of their nation. The understanding needs to be extended to:

- Why people perceive an issue as important?
- On the basis of what knowledge and information do they make those judgments?
- How they would frame that issue as a policy problem?
- What policy responses they think would be appropriate?

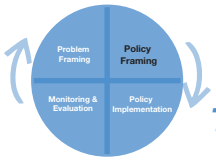
A good understanding of this across the whole population and for major population segments will be very valuable before engaging in a national debate or starting to frame policy responses.

A national debate about SCP would profit considerably from credible information provided by science and other sources of knowledge regarding the underlying causes of sustainability problems. It is also important to discuss the most promising solutions to mediate those problems. It is characteristic of SCP problems that policy makers will have to deal with ignorance, uncertainty and risk. It is important however, for policy makers to make decisions despite the undeniable fact that we cannot know everything beforehand. The precautionary principle gives a good lead into this. The precautionary principle argues that where there are threats of serious and irreversible environmental damage, a lack of scientific certainty should not be used as a reason for postponing measures to prevent potential environmental degradation.

Very importantly, SCP policy makers need to assess the policy environment based on an understanding that SCP policies cannot work in isolation. Individual or group behaviours that cause environmental degradation or present opportunities for improvement of the environment are shaped by multiple factors, including other policy settings. There may exist social and economic policies that determine patterns of consumption and production, that have unintended consequences for environment and sustainability. These will need to be adjusted to support SCP. The design of policy interventions has to identify other policy settings and the incentives and disincentives they create. This includes identifying existing policies that may be amenable for change via policy reform, in order to help progress SCP goals.

All the steps outlined here help to shape the definition of a policy problem. Policy problems are for solving while issues are for debating. This step in the policy cycle, of problem definition, often involves breaking problems down into sub-sets that are more suitable for policy attention.

If the important steps in framing a problem and agreeing upon the nature of the problem are not attended to, the subsequent steps in the policy cycle, in particular policy implementation will become an increasingly difficult task to achieve.



The policy framing phase

Like all other policy decisions, a range of imperatives bears upon different policy actors influencing SCP policy decisions. For SCP policies, the considerations that determine the nature of the policy direction taken, need to be clearly stated and may take the form of policy principles. Well-articulated policy principles will have three benefits.

1. They will specify the logic and meaning of the social goal that is guiding the economy and consumers towards higher resource efficiency and lower emissions. In more operational terms, to ensure that the most important actors within the policy network understand the drivers of the goal.
2. They will enable policymakers to widely communicate the meaning and importance of the SCP objectives to all members of the policy community and will help justify the policy decision. This will profoundly enhance the transparency and accountability of the SCP policy proposals to the broader public.
3. SCP problems are still relatively recent additions to the policy agenda. They also must be dealt with across multiple policy sectors that are not always used to collaboration. In other words, it cannot be assumed that the SCP policy principles have already become background knowledge within the administration and hence must be articulated to enhance the success of SCP policies.

The policy and institutional challenges that need to be addressed by the guiding principles include: the long-term perspective of SCP policies, their global dimensions, the need for policy integration across different policy domains, a focus on scientific and other information, the application of the precautionary principle, the need for participation and the innovative character of policy approaches that will be underpinned by substantive material principles.

Policy principles provide guidance but they are not rules. Governments will require some flexibility to decide priorities in a given context and their priorities may favour or override some principles. Some of the principles may be conflicting and need to be balanced against each other and with policy objectives from other policy domains. In many policy-making situations, especially in developing countries, other social goals such as near-term economic growth may contradict SCP objectives, leading to trade-offs between development objectives and SCP objectives. Ideally, there should be integration between conflicting policy goals minimising the trade-offs as far as possible. Chapter 2.1 highlights how poverty reduction and SCP policies can work together.

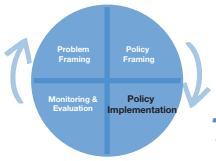
The SCP policy statement

The most visible step in the policy process is the policy statement, which is usually publicly available. The policy statement makes policy decisions and directions, including the policy principles, a publicly accessible record. It is the nature of democratic politics that governments will issue policy positions or statements. The policy statement will:

- Identify the mandate and authority
- Identify the problem
- Explain the problem context
- Detail implementation
- Describe ongoing activities.

Measurable policy goals

An important element of the policy framing stage is the identification of measurable policy goals in relation to the identified SCP problems. Often these may be vague, but it is desirable that core parts of the goal set are measurable, so that later monitoring, evaluation and learning is possible.



The policy implementation phase

The selection of policy instruments is the most critical step in the policy cycle and of greatest importance for achieving policy goals. This is also the step where causes of policy failure are often located. SCP policies are interventions into interdependent human-natural systems. This is a complex task and demands complex interventions, which may speak for a mix of policy tools. The fundamental task of SCP policies is to change individual or collective behaviours through policy instruments which are employed to guide or steer that change. Commonly policy instruments can be distinguished as regulatory instruments and standards, economic instruments, information-based instruments and voluntary agreements. These will be further explored in Chapter 3.2, Policy Tools and Instruments for SCP. Obviously, this can include a large variety of interventions available to SCP policy.

Table 3:2 Selection criteria for policy instruments

Criteria	This includes
Effectiveness criteria: determining the likelihood of the SCP policy instrument achieving goals in the absence of constraints.	Information requirements Dependability Corrective versus antidotal focus Systemic potential Flexibility in space and time Efficiency Complexity and cross-sectoral influence
Implementation criteria: determining the likelihood of the SCP policy instrument being successfully advocated and implemented.	Equity implications Cost Social and political feasibility Institutional feasibility Monitoring requirements Enforcement/avoidability Communicability

Implementation plan

The plan of how to implement policies for SCP may be sufficiently incorporated in the policy statement and the associated discussion and documentation. However, the implementation plan needs careful attention as it is a dynamic process which may need continuous adjustments. Usually, the implementation plan will change and become more detailed once the role out of a policy has begun. Implementation planning, based on the instruments chosen, typically includes the following considerations:

- Is additional information required for the key policy officials who will be engaged in policy implementation?
- Are there others who will be involved or affected by the policy that will need additional information, including how this information will be generated and communicated?
- Are all statutory and administrative requirements and the resources in place that will be needed in the implementation phase?
- Are all issues of enforcement and compliance including resourcing and responsibilities in place?
- Has a monitoring process been put in place, including defining routine data capture and responsibilities?
- All these elements will be of particular importance in the SCP policy domain, due to the crosscutting nature of the SCP goals.

Communication and information plan

The specific information and communication needs will vary across SCP policy instruments and jurisdictions. However, key forms of information will typically include a detailed description of the main features of the instrument, of variations across the context where the instrument will be applied and about the organisational capacities and resource requirements for implementation.

Table 3:3 Examples of information needs and main audiences for SCP policy instruments

Instrument	Information needs	Main audiences
Regulatory standard for pollution for industry sector	Technical details of the standard Compliance regime (licensing process, inspection regime) Sanctions (fines, license suspensions)	Firms, operators, relevant agency staff All of the above and other enforcement agents All of the above and lawyers and courts
Carbon tax for large polluters with revenues invested to fund renewable, energy efficiency and to compensate lower-income households	Intent and structure of the policy Tax rates, details of the payment schedule, compensation packages	Industry, consumers, relevant departments Firms, tax officials, accounting professionals

Multiple tasks must be integrated in one communication strategy to engage with different audiences. Since many instruments will need to be implemented by actors distant from the policy process a two-way communication approach will be needed. This will encourage implementers to feed their experience back to the policy makers, to allow for adjustments that reflect the context specific nature of the implementation process of SCP policies. This will ensure that national policies are well understood and implemented at the provincial level and that the local experience is fed back to the relevant government departments.

Statutory, institutional and resource requirements

One major issue for policy implementation is often ensuring that the policy agency and other actors involved have the capacity to properly implement the policy instrument that has been selected. Key capacities include the legal competence, institutional and organisational capacity, financial resources and human resources. In the case of SCP polices, considerable capacity building may be required, which needs to be planned for in the early stages of the policy planning process.

Legal competence and defensibility

SCP policies, like any other public policies, must be legally defensible, i.e. not liable to challenge over their validity in the courts. To achieve this, the legal basis of SCP policies may need to be insured in statute law, common law and as is the case in Asia and the Pacific, also in customary law. Particularly with novel policy instruments and new organisational strategies, the adequacy of the statutory setting requires close attention.

Institutional and organisational capacity

SCP policy instruments are often new and unfamiliar or they may involve the application of traditional policy instruments in untried sectors of the society or economy. Special care needs to be taken to ensure that there is capacity to deliver. This concerns the government agency or organisation with primary responsibility for policy implementation and agencies and organisations or non-government groups who have delegated or subsidiary roles in policy implementation. In the case of very complex new policies, such as for instance, an ecological budget and tax reform, the tax department, the environment department and treasury would need to work together to implement the new policy instrument. Very often, those departments would not have a history of successful cooperation in the past and collaborating would involve a steep learning curve for all government officials involved.

Financial resources

The most commonly recognised cause of failure is inadequate funding. If the level of optimal funding cannot be achieved, it is important to develop a realistic understanding of the limits that the funding shortfall creates, relative to the scale of the problem, to avoid unrealistic expectations in the policy community. A realistic understanding of such financial limits may invite consideration of supplementary or additional policy initiatives. Sometimes, a poor analysis of costs may be the problem behind insufficient funding, highlighting the need for careful financial planning to reduce the chance of unforeseen deficiencies.

Human resources

Sustainable consumption and production is a relatively new domain of public policy. Therefore it is very likely that there will be a need for new or extended knowledge and skills on the part of agency staff responsible for planning, designing, and implementation of the policy. This may be relevant to the quantity of human resources, that is the number of staff available and the quality of human resources including knowledge, skills, and preparedness. A potential shortage of staff is a very general issue and can rely on established strategies to deal with such shortages.
There are three broad areas of skills and capacities that need to be addressed:

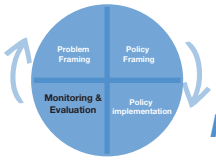
1. Background knowledge regarding the logic of the policy approach chosen, especially if the policy instrument is unfamiliar or substantially different from previous routine and experience.
2. Technical knowledge and skills concerning the policy instrument in question.
3. Contextual knowledge of the sectors, regions, community subgroups or industries where the instrument will be implemented.

Capacity building for human resources has traditionally been attended to within agencies. However, for SCP policies, capacity building needs to include the aspect of inter-agency and whole of government implementation as well as engagement with the wider policy community.

Enforcement and compliance

When the implementation of the policy instrument is designed, issues of compliance and enforcement measures need to be included. This will result in a better understanding of resourcing and communication requirements and of ongoing monitoring needs. There are three aspects of compliance:

1. Compliance in undertaking assigned responsibilities for implementation on the part of responsible authorities and others involved in the implementation such as government staff.
2. Compliance by those directly addressed by the instrument such as firms, individuals or households.
3. Compliance with enabling or subsidiary aspects within and outside of government.



Policy monitoring and evaluation phase

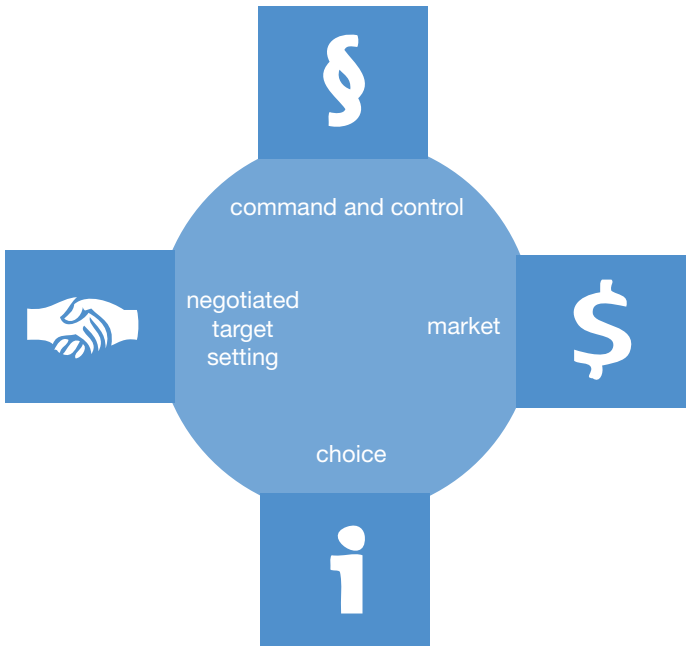
Provisions for policy monitoring should be integrated in the policy process as early as possible. They need to recognise the link between SCP monitoring through SCP indicators and monitoring of the effectiveness of the policy instruments chosen. Policy monitoring should be closely related to policy goals and should include routine data capture. It is important to set in place a timetable for review and evaluation of any SCP policy instrument. The policy monitoring and evaluation phase will be discussed in greater detail in Chapter 5.

3.2 Policy tools and instruments for SCP

Introduction

This section introduces some of the groups of policy tools that governments have at their disposal to influence consumption and production patterns. It covers regulatory tools, economic tools, information-based/educational tools and voluntary agreements. This is not an exhaustive list of policy tools; it is rather a categorisation of some of the more widely applied approaches. This chapter is based on Bengtsson et al. (2010).

Figure 3.2: Policy tools and instruments



§ Regulatory tools: command and control

Definition and Background

Regulatory tools have been used by governments for a long time and are the basis for environmental policy making all over the world. Regulations can mandate or prohibit specific behaviours or the use of a certain technology, define a level of sustainability performance to be achieved etc. They need to be used together with mechanisms for monitoring and sanctioning in order to ensure compliance. Regulatory tools are sometimes referred to as "command and control instruments", reflecting the way they are implemented. Regulations that are of relevance for SCP can be divided into the following three general categories: environmental quality standards, technical/emission standards and restrictions and bans.

1. *Environmental quality standards* specify a minimum desired level of environmental quality, or the maximum level of pollution of a certain medium. An example is quality standards for urban air.
2. *Technical/emissions standards* specify either mandatory technical equipment to be used in certain applications, or maximum levels of emissions or resource consumption for specific products or systems. For example, many countries require automobiles to be equipped with catalytic converters (a technical standard) and, in addition, they regulate maximum emission values for certain pollutants for vehicles (an emission standard).
3. *Restrictions and bans* refer to the direct limitation of an undesirable behaviour or technology, or restrictions on the sale or use of certain products/substances with negative environmental and health impacts. An example is the prohibition of lead additives in gasoline or a ban on dumping end-of-life vehicles in nature.

In order to be effective, regulatory tools need to be complemented by some form of monitoring system. It is also necessary to specify who is responsible for taking action in case the regulations are violated. Some form of appropriate sanctions or penalties, such as fines or prison sentences, are also needed in order to deter violations. These enforcement measures can add considerable costs to the policy implementation.

Regulatory tools can be implemented as stand-alone tools, but many policy problems require a set of regulations to be put in place. For example, a ban on waste dumping would normally be associated with a requirement on some specific actor, typically local authorities, to collect waste and ensure proper treatment. To continue with this example, technical and performance standards may also be needed in order to make sure that the waste treatment has limited negative impacts on humans and environment.

Box 3:1 Regulatory tools to reduce smoking

The government can use regulations in a number of ways to make smoking less attractive and convenient. Advertising of tobacco products can be restricted, either completely or in certain media. Sale to children and youth can be banned. A licencing system can limit the number of shops selling tobacco, making the products less available. Producers can be required to put warning texts on their packages or to use plain packaging without company logos. Smoking in restaurants and public buildings can be banned.

Strengths and limitations

There are several benefits of regulatory tools, which explain their dominant position in environmental policy making. For governments, the setting of targets/standards is inexpensive and the goals for policy achievement are clear. These tools have proven to be effective for addressing directly visible damages and point sources of pollution.

On the other hand, industry tends to be reluctant to submit to command and control regulation. Their argument is often that uniform regulation ignores the unique situation of each company, including differences in compliance costs and therefore leads to excessive overall costs. Such resistance has in many cases hindered the effective implementation of regulations. Another concern over these tools is that they are static, in the sense that they only require compliance with certain targets and therefore provide no incentives for further improvements beyond those targets. In addition, in cases where regulations are used for a few large entities, such as major industrial production plants, the compliance can easily be monitored, but in cases where the number of regulated entities is very large the enforcement costs can be excessive. This can be a challenge for regulations that target individual households or SMEs.

However, the challenges of implementing regulatory tools effectively do not imply that they should be avoided or replaced with other tools. What it means is that to effectively regulate impacts of products with globalised life-cycles and to increase their resource efficiency, it is important to have more comprehensive, dynamic and flexible policy approaches. This can be achieved by introducing and using regulations in a more flexible manner and/or by combining them with other types of tools. Some examples of how this can be done are given in a later section - Diversifying the policy repertoire.

Box 3:2 Regulatory tools and the life cycle approach

Regulatory tools can be used at various points in products' life-cycles. At the stage of resource extraction, a quota system to control the volume of resource extraction, and requirements to restore mining sites into green areas are two examples. At the production and consumption stages, technical standards can be used for example to promote energy efficiency, to mandate the procurement of products made of recycled materials, or to ban the use of certain materials or designs that are difficult to treat at end-of-life. Examples at the waste management and recycling stage can be prohibition of waste dumping and inappropriate waste treatment, rules mandating waste separation by households, or emission standards for waste disposal sites and recycling facilities. At all stages, from materials' cradle to their grave, there is room for regulations to promote greener practices and to reduce unsustainable patterns of production and consumption.

$ Economic tools: creating market-based incentives

Definition and Background

Economic tools work by encouraging or discouraging certain behaviours and practices through economic incentives. Prices for products and services, set by the market, do not properly reflect environmental and social impacts. Therefore, these prices send the wrong signals to the market actors and encourage overconsumption of natural resources, low levels of efficiency, and unnecessary pollution. Governments are in a unique position to change these incentives so that the short-term self-interests of producers and consumers are better aligned with the long-term social objective of sustainable development.

- One of the basic ideas behind economic tools is that by adjusting prices through policy interventions, so that environmental and social costs are to some extent reflected in the prices of materials and products, the decisions made by producers and consumers can be brought more in line with overall societal objectives. Such internalisation of societal costs, which is based on the widely accepted polluter-pays-principle, can be achieved through *taxes or use charges*, with supporting policy to ensure the poor's access to resources for their basic needs.
- Economic tools can also be used for facilitating the adoption of cleaner and more resource efficient technologies and practices through *subsidies, soft loans and tax reductions.*
- A third type of economic tool is *tradable permit schemes*, where market players are allowed to buy and sell permits to extract or use a specified amount of a resource or to emit a certain amount of a pollutant. Such permit schemes can be used in order to achieve a fixed environmental target, such as a maximum amount of air emissions, in a cost efficient way. Tradable permits are mainly applicable to larger companies.
- The fourth type of economic tool is *deposit-refund schemes*, which provide an economic incentive for the user of a product to return it to designated collection points at the end-of-life. In such schemes the consumer has to pay an extra amount of money (a deposit) at the point of purchase but gets the money back (a refund) when he or she returns the product. Deposit-refund schemes are used by many governments for example to increase collection rates of empty beverage containers for reuse or recycling, and used car batteries for safe treatment.

The number of applications of economic tools to the policy field of SCP has grown steadily since the 1970's. It is commonly argued that economic tools are currently underutilised and that a more wide-spread adoption would contribute to enhanced efficiency and effectiveness of environmental policy making. Economic tools and instruments are discussed further in Chapter 11, Ecological Budget and Tax Reform.

Box 3:3 Economic tools versus regulation - managing depleting aquifers

Economic tools differ from regulations in a number of significant ways. Here we will use the example of water consumption to illustrate some of the key differences. A number of water-consuming industries are sourcing their water from the same groundwater aquifer and this resource is rapidly becoming overexploited. One way of addressing the situation would be to regulate the amount of water that each industry has the right to withdraw (a regulatory tool). Another way would be to introduce a withdrawal charge (an economic tool). If regulation is used the government would have to assess the water need of each industry, including its potential for recycling and efficiency improvements. Once the system has been established the government would need to monitor withdrawal by all industries included and take action against violations. The government would also need to review and revise the allocation of withdrawal rights on a regular basis. In sum, the regulatory system would require a lot of administration and thereby incur significant costs for the government. In contrast, if the government decided to use water withdrawal charges to address the water scarcity situation it wouldn't need any information on the water need of each facility or the potential for efficiency improvements. However, they would need to establish how high the withdrawal charge should be in order to reduce the combined withdrawal to a sustainable level. If the charge is set too low it will be ineffective while if it is set too high it will place an unnecessarily high burden on the targeted industries. In order to set the charge at an appropriate level the government would need to have access to relevant data and have capacity to conduct economic modelling. Once the system has been established the withdrawal of each industry would need to be measured and the government would need to collect charges. Also a system based on economic tools would thus require significant administrative efforts of the government. An effective and fair system that ensures sustainability without unreasonable economic consequences for the industries affected requires additional costs for governments. Good governance does not come for free – no matter what kind of policy tools are used.

Box 3:4 Economic tools to reduce smoking

The most common economic tool for tobacco is a tax which makes the products more expensive and therefore reduces consumption. However, it is possible to use also other kinds of tools, such as legislation that makes producers liable for health impacts of their products and allows consumers to sue producers in case their health has been damaged by smoking. Other options are for example to offer government employees cash compensation if they quit smoking.

Strengths and limitations

The two most commonly cited advantages of economic tools over regulation are their ability to provide incentives for innovation and improvement beyond a certain level of performance and their cost-effectiveness. Economic tools can have a more dynamic effect since they provide continuous incentives, which regulations and standards typically don't. They can be more cost-effective than undifferentiated regulations that do not reflect that some industries may be able to improve at lower cost than others.

However, as discussed in relation to the example above, economic instruments also require adequate institutions for design, implementation and enforcement. Charges and taxes need to be collected, and effective monitoring is needed to avoid free-riding. In general, the effects of economic tools on environmental quality and resource consumption are not as predictable as under a regulatory approach. Changing conditions and increasing incomes or profits may affect ability-to-pay and consumption levels. Regular assessments of the effects of these tools are therefore needed and frequent revisions may also be required.

Information-based tools: enabling informed choices

Definition and Background

Information-based policy tools have become more popular in recent years, partly because of the IT revolution which has decreased the costs of information dissemination. This is a very diverse group of tools, but two basic clusters can be distinguished.

1. The *government provides information* to some actor group or society at large. This can range from very general information on overall policy objectives, such as to increase energy efficiency in SMEs over the next five years, to highly specific and targeted information, such as technical training for SMEs in how to improve energy efficiency.

2. The *government requires some actor to provide certain information* (information disclosure), such as data on emissions of toxic substances from production facilities or on energy consumption of products during the use phase.

On a general level, information tools are intended to provide knowledge on the environmental performance of certain products, services or systems in a standardised manner so that stakeholders, such as consumers and investors, can make better informed choices – avoiding less sustainable options to the favour of more sustainable ones.

Box 3:5 Information based tools to reduce smoking

Education in schools on the health risks of smoking is one of the commonly used information-based approaches. Targeting adult smokers the government can run various kinds of awareness campaigns, involving media and working in partnership with NGOs that are active on health and consumer protection. Hospitals and clinics can be encouraged to provide advice to smokers who want to quit but don't know how to break the habit.

Strengths and limitations

One of the main advantages of information-based tools is the low implementation costs compared to the complex administration often needed in order for regulations and economic tools to work properly. However, the effectiveness of an information-based tool depends of course completely upon to what extent it actually influences behaviours and practices in a sustainable direction. Therefore, these tools are more likely to be effective in markets where consumers, investors, government officials and other key actors already have a high level of awareness on environmental issues and where there is a widespread demand for a clean environment. Without the existence of adequate background knowledge and basic sustainability values among the key actors, information on environmental performance is not likely to generate significant changes in behaviour.

Another factor often seriously limiting the effectiveness of information as a policy tool is that economic factors usually pull consumers and other actors in an opposite direction. In situations where more sustainable products and services are much more expensive than comparable options with higher environmental impact, information disclosure, such as eco-labels, cannot be relied upon to bring about changes towards sustainability.

In general, information-based tools cannot be expected to function as substitutes for other policy tools, but should rather be regarded as supplements, which can enable stakeholders to improve resource efficiency and pollution abatement. However, there are cases where information-based tools by themselves have been effective; in particular, requirements for industry to disclose information on environmental performance to the public have often led to significant improvements. Another area where information-based tools have been used with some success is for product labelling on energy efficiency. In this case, consumers usually have an economic incentive to buy more efficient products so there is no trade-off between sustainability concerns and economic considerations.

Voluntary agreements: negotiated target-setting

Definition and Background

Voluntary agreements aim to promote environmental improvements through voluntary action. This usually implies that firms make commitments that go beyond legal requirements. Two well-known examples are the Responsible Care Program for chemical management developed by major chemical companies through their global industry association and the Zero Landfill programme of major manufacturers in Japan.

OECD (2003) distinguishes four types of voluntary agreements:

1. *Unilateral commitments* made by polluters or resource users.
2. *Private agreements* between polluters or resource users and those who are negatively affected.
3. *Negotiated agreements* between industry and a public authority. This negotiated kind of agreement has a stronger legislative character than purely voluntary approaches. It is an agreement which can include

legally binding obligations to follow an action plan established through negotiation. The agreement can even involve sanctions for non-compliance. However, the negotiation element makes these policies different from typical regulatory approaches.

4. *Voluntary programmes*, in which "participating firms agree to standards (related to their performance, their technology or their management) which have been developed by public bodies."

Also, management standards such as the ISO 14000 series can be understood as voluntary agreements of the first type. While such standards are not strictly policy tools, they can be used, for example by requiring that all major suppliers to governmental agencies be certified.

Box 3:6 Voluntary approaches to reduce smoking

Voluntary approaches can be considered as complements to regulation. It can be more effective and less costly for the government if producers voluntarily agree to certain restrictions, such as bans of advertising to teenagers or of brands and flavours that mainly target youth. Voluntary agreements can target also other actors than producers; for example in cases where there are no legal age restrictions, the government could try to reach voluntary agreements with shop owners not to sell tobacco products to consumers under a certain age.

Strengths and limitations

Voluntary agreements are obviously more flexible than command and control regulation and compliance can be less burdensome than for market based instruments. They are therefore commonly favoured by the business sector. However, the literature on SCP policy tools does not provide much evidence of voluntary agreements being particularly effective. In addition, there are concerns that such agreements can give undue benefits to large market-leading companies by promoting their business models and technologies. Voluntary agreements are likely to be more effective in situations where there is a high possibility of command and control regulation or economic tools being used. It is typically easier to convince industry to make strong "voluntary" commitments if there is a widespread perception in that industry that mandatory policy tools are otherwise likely to be introduced.

OECD argues that it is generally more effective to use regulatory tools with some flexibility, and based on discussions with the regulated industry or actor group, or to use market-based tools, than to encourage voluntary commitments. Negotiated agreements with binding targets and a phase-in period can be a compromise and a way to increase acceptance for regulation. As discussed further below, voluntary measures can play an important role for motivating additional efforts of companies that already have a high environmental performance, while legally binding measures may be the most effective for ensuring improvements of the majority of companies in a specific sector.

Diversifying the policy tools repertoire

The majority of sustainability policies are based on regulatory tools. Significant improvements have been achieved through such policies, especially for local environmental impacts. However, regulatory approaches have also been successfully employed at the international level, for example in the phasing out of ozone-depleting substances and for reducing the use of hazardous substances in electronics. These tools are likely to remain the corner stone of environmental and resource policies.

However, regulations have a number of limitations and there are good reasons for governments to also consider other tools. This section discusses how regulatory tools can be combined with other tools for enhanced effectiveness and how they can be implemented in ways that reduce compliance costs and resistance amongst industry and consumers.

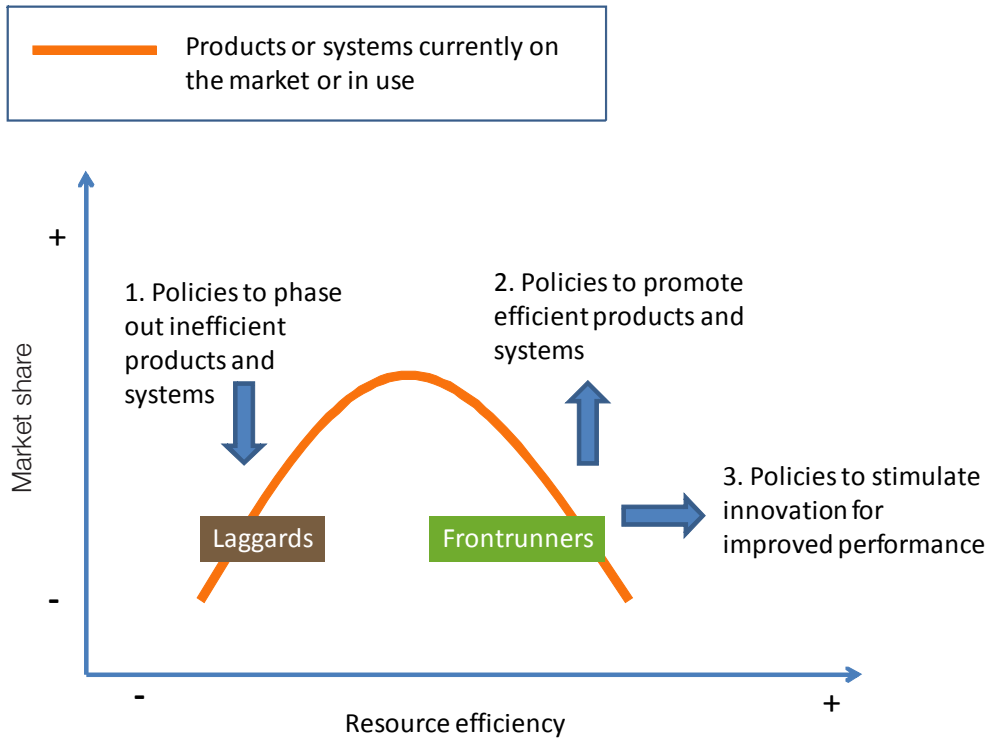
Combining tools for enhanced effectiveness

Policy tools can be especially powerful when employed in combination. Such policy mixes can for example combine an economic incentive, such as an environmental tax or a use charge, with an information-based policy tool, which makes it easier for households or companies to change their behaviour. An example related to households' energy consumption could be a combination of an electricity tax (economic tool providing incentive) with mandatory energy consumption labelling of electrical appliances (an information-based tool helping consumers to select better products and cut their energy bills).

SCP policy tools are used for shifting companies' or households' behaviour and consumption and production patterns into a more sustainable direction. This typically calls for a combined policy approach including both

tools to phase out undesirable products and behaviours, and tools to expand the market for more sustainable products or to provide incentives for more sustainable behaviour. Figure 3:3 illustrates this need for multiple policies to edit out bad options (laggards), to increase the market share of better ones (frontrunners), and to stimulate innovation towards further improved products, systems and practices.

Figure 3:3 Three types of policy interventions aiming at improving the resource efficiency of products and systems



Source: (Adapted from ASCEE 2008)

These three types of policy intervention will generally require different policy tools. It is not realistic to expect that one single policy tool can effectively edit out an undesirable product from the market and at the same time stimulate innovation towards more sustainable options. In addition, certain policy tools may be effective in stimulating technical improvement of existing products, while other tools may be needed to encourage more radical innovations at the systems level. For example, technical standards can be important tools for improving the performance of an established kind of product or production process, but they typically don't provide any incentives for systems innovation. In order to create drivers for such more fundamental innovations, including changes in consumer behaviour, other policy approaches and tools are required. For example, in addition to improving the fuel efficiency of automobiles there is a need to support a range of other developments, such as to stimulate new energy sources for private vehicles, to facilitate the dissemination of social innovations such as car sharing, to develop public transportation systems into viable alternatives to cars, to facilitate walking and bicycle transport, and to reduce mobility needs through improved city planning.

Ensuring policy integration and coherence

When a government reviews and strengthens its SCP policy portfolio it needs to consider how policies in non-environmental domains shape patterns of production and consumption. While there is a need for dedicated SCP policies, it is also important to assess the implications of policies in other areas for SCP objectives. There is often a tension between sector policies, (for industrial development, agriculture, construction etc.) that generally aim to boost consumption and SCP policies that seek to moderate consumption levels and shift consumption patterns. In order to make significant progress towards SCP, governments need to understand how its sector policies and fiscal system influence patterns of production and consumption, and to make revisions where there are conflicts with sustainability objectives.

To effectively move society towards SCP, governments need to send coherent messages. Clear visions need to be established and communicated; consistent and well-coordinated policies, including sector policies as well as dedicated SCP policies, should create incentives and legal obligations towards that vision. This requires leadership from the highest political level and coordinated action by the governmental departments concerned.

Flexible implementation but firm long-term targets

Some of the actors affected by a new policy may be able to quickly adjust, while others may need a longer time. For example, a manufacturer that is just about to renew machinery is more flexible than one where a large investment has just been made. In order to be effective, and to reduce resistance to new policies, it is therefore desirable to leave room for some flexibility. This can be achieved in different ways.

The flexibility associated with economic tools is often mentioned as an argument for a more widespread use of these tools. Companies that can quickly and easily adjust their production processes and products need to pay less. Those who have difficulties in adjusting, or where the costs of making adjustments are high, will have to pay more. Each individual company is free to calculate what changes would be most beneficial for them and to make their decision accordingly. A uniform regulation, requiring the same performance level of all companies in an industry, could entail higher overall compliance costs and would cause stronger resistance.

However, it is possible to develop and implement also regulatory tools with a certain degree of flexibility. Involving the groups targeted by a proposed policy (such as companies, consumer groups, or farmers) in the drafting process can help build awareness, understanding and support. Consultation processes can also inform the policy design process on the circumstances of targeted groups and on obstacles to compliance. By being provided the opportunity to influence the policy design and the implementation schedule, companies and others can be expected to feel a higher ownership of the process and thus be more likely to respond positively. Finally, consultation processes provide “early warning” to the affected groups and make it possible for them to start preparing for expected future policies. Consultation processes require extra time, but the outcome can be better designed policies and more favourable conditions for successful implementation.

It can also be wise to announce planned policies well in advance so that the affected stakeholders have time to adjust. Similarly, a step-wise introduction can facilitate compliance and reduce related costs. Experiences from developed countries, for example in relation to automobile emission standards, show that clear long-term timelines with fixed tightening of performance standards can be an important driver of technological change. If future standards are set and announced several years in advance, industry has more time to innovate and invest. However, in order to be effective, long-term timelines and targets need to be robust to political changes. If there is some uncertainty whether an announced future policy will in fact be implemented or not, this can seriously reduce efforts (such as investments in product development and production facilities) needed for compliance.

Further reading 3

The Australian Policy Handbook is an excellent guide to the practice and process of public policy and combines sound analysis and practical know-how of great value to policy makers and practitioners.

Althaus, C, Bridgman, P & Davis, G 2007, *The Australian Policy Handbook*, Allen and Unwin, Crows Nest.

Policy Instruments for Resource Efficiency: Towards Sustainable Consumption and Production, is a good starting point to understanding different types of policy tools, their advantages, disadvantages and where they can be applied towards SCP objectives.

GTZ 2006, *Policy Instruments for Resource Efficiency: Towards Sustainable Consumption and Production*, GTZ, Germany.

Sustainable Consumption and Production Policies: a policy toolbox for practical use provides practical explanations of SCP policies and policy instruments. It further recommends instruments that could be applied to increase the positive environmental and social impacts of specific projects. Special attention is paid to small and medium size enterprises (SMEs), which form the majority of business operations in Asia.

SWITCH Asia Network Facility, n.d., *Sustainable Consumption and Production Policies: a policy toolbox for practical use*, United Nations Environment Programme, Paris.

Instrument Mixes for Environmental Policy is a comprehensive publication that provides descriptions and analysis of how various policy instruments can be combined to achieve higher impact. Chapters are organised to demonstrate combinations of policy instruments for different sectors and different points in the production-consumption system.
OECD 2007*, Instrument Mixes for Environmental Policy*, Organisation for Economic Co-operation and Development, Paris.

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4 Policy Implementation

4 Policy Implementation

Key Learning Points

- High level political support is necessary for successful SCP policy implementation.
- SCP policies are highly cross-cutting: their formulation, implementation and monitoring require a high degree of inter-agency collaboration within Government.
- Integrating SCP policies into key policies, strategies and plans should be the preferred approach, rather than formulating them as stand-alone policy areas.
- Adequate communication and education to all parties, including the community increases the likelihood of successful implementation.
- The government can play multiple roles in pursuing SCP but has its limitations. SCP agendas need multi stakeholder engagement and partnerships.
- It is important to engage with the business community, civil society groups and other non-governmental organisations such as consumer groups and the media.

This chapter provides more detail on the policy implementation stage of the policy cycle. Complementing the theoretical approach outlined above, Chapter 4 focuses on the practical and strategic side of implementation, considering the multiple dimensions of successful implementation.

4.1 Political support and mainstreaming SCP

Introduction

The SCP reform agenda is complex as it invests how societies and economies are structured and function. Efforts to promote SCP have a much higher chance of being successful if top-level political leaders understand the importance of changing patterns of production and consumption into a more sustainable direction. SCP is by its nature highly cross-cutting. Effective policies therefore often have to be developed in collaboration between line ministries. It is important to have effective mechanisms in place to support such collaboration. Establishing a co-ordinating body with sufficient authority and resources can be an essential step towards more coherent and effective policies.

At a formal level of policy formulation, countries need to review what policies, plans and strategies they already have in place and to explore how SCP can be integrated into these existing mechanisms rather than launching SCP as a new free-standing initiative. Some areas that may offer particular potential for integrating the SCP perspective include: climate change mitigation, energy security, food security, health, water and consumer safety/consumer rights. Many countries in the region also develop overarching plans with a five-year interval. It is of key importance to integrate SCP into such strategic economic planning, not only in chapters dealing with environmental protection as such but also in chapters on the development in major economic sectors.

Harnessing high-level support for a complex reform agenda.

The formulation and effective implementation of SCP policies and strategies affect the deeper structure of economies and societies. This involves therefore a very complex agenda of re-orienting economic systems, consumers' preferences and producers' behaviours. The agenda embraces key economic sectors, such as energy, agriculture, transport, etc. It can offer opportunities for decoupling economic growth and social development from environmental degradation, thus strengthening the sustainability and resilience of a society. It can further help to seize new development opportunities that can contribute to growth and poverty alleviation. A coherent SCP policy agenda can support a triple dividend of greater wellbeing, increased competitiveness, and environmental integrity (CSIRO and IGES 2012).

In the real world, this agenda is likely to encounter resistances: these can be expressed openly or covertly by interest groups within the government apparatus, in the business community and beyond. In particular, lobbies, trade associations and other more or less transparent policy influence mechanisms can be very effective in working towards maintaining the existing systems though which wealth is generated and shared. Resistance and impasse may also arise from the sheer momentum required to bring change for examples in complex

production chains, which may have been structured according to unsustainable paradigms for a long time (e.g., involving costly industrial processing plants, large-scale agricultural input supply chains, etc.). Production systems may also be driven by regional or global factors outside the influence of national policy making.

The demand side of the agenda is no less complex. Asian societies are changing rapidly. Average per capita consumption is rising fast, albeit across a wide range. Urbanisation (by 2030 55% of people will live in urban areas) reshapes consumption for food, transport and housing. A booming middle class is driving urban consumption increasingly shaped by globalising forces. The vast majority of the population at in the most vulnerable societies often battles to meet basic needs but at the same time accounts for the largest percentage of purchasing power in the world (De Vera et al. 2011).

Obtaining reform momentum and effectiveness therefore requires actions at multiple levels and across multiple sectors. A reform agenda of this nature is unlikely to proceed in a linear manner. It will rather be implemented as an iterative process, where regulatory interventions, fiscal and other incentives, voluntary agreements, and interventions to support behavioural change in the public will reinforce each other over time.

Pathways of change towards SCP goals may take multiple routes, from mainstream policy change, large scale investments or incentive schemes, to innovation in niches of production and/or consumption which may be scaled up after establishing an initial success. Leadership support is therefore required at several levels and in a flexible way. A lead agency or an effective coordinating mechanism among line agencies and stakeholders become crucial. Above all, the reform process needs to maintain high visibility on the ultimate goals of the SCP strategies within the government administration and political leadership, the public, consumer's bodies, and producers (these points will be elaborated in the following sections).

Box 4:1 Relevance of leadership and high level support in SCP implementation

A recent study in Asia shows the relevance of leadership and political support not just in the formulation of SCP policies but moreover to support their effective implementation. Lessons from around the region point out that:

- It is advantageous if there is a **single responsible authority for coordinating SCP activities** in a country to avoid confusion, duplication of efforts, conflicting activities, and inertia.
- The two main functions of the coordinating authority are to show **leadership and capacity for decision making**, in order to reduce complexity, and to help build linkages among all actors that need to be involved.
- Leadership and high level support are required to build the necessary **human capital and knowledge** about SCP issues and policies within central agencies as much as within state, local authorities and city governments. Capacity at these levels is crucial for successful implementation.
- High level support is also required to **drive complex public policy reform and maintain incentives** to favour SCP among business actors and consumers. Policy makers usually find more difficult to shape consumption than regulating production; this is especially so in developing countries, where over and under consumption exist. Coherent choices in infrastructure development and urban planning can complement public awareness initiatives. SCP in public procurement can both shape a significant proportion of consumption and set a public example.
- For society at large it will be crucial have **champions of SCP among community leaders and decision makers** who promote innovative technologies for SCP and sustainable lifestyles.

Source: (CSIRO & IGES 2012) modified.

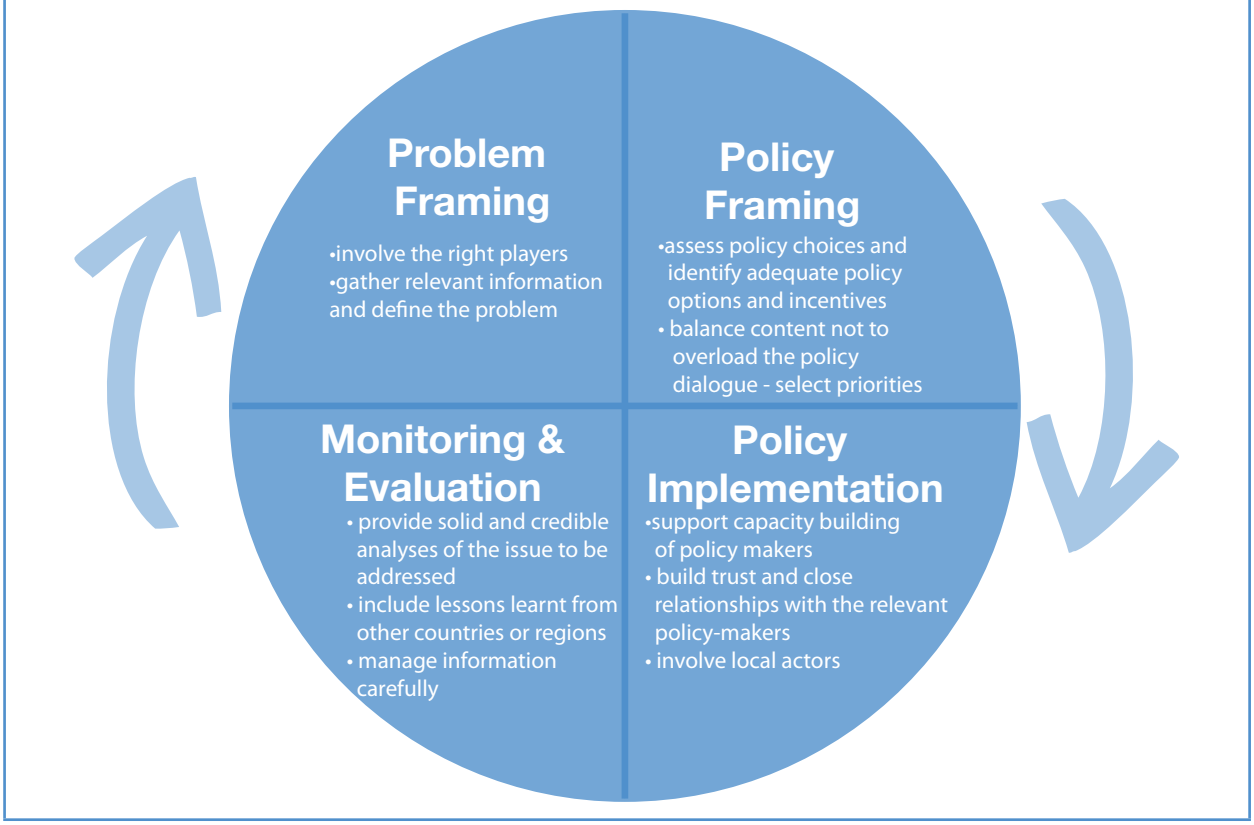
A number of actions and strategies may facilitate obtaining and maintaining high level political support:

- Align or, better, **integrate SCP goals within mainstream economic or sector development strategies** to foster convergence and deleverage conflicting agendas (this will be reviewed in the following section)
- Identify explicit, **easily communicable SCP long term goals** to provide a sense of direction and focus on long term gains.
- Conduct an explicit stock-taking of **multiple and potentially conflicting interests** (e.g., via a robust initial stakeholder analysis) within economic sectors and identify coherent development opportunities and win-win reform options.
- Produce and disseminate easily communicable **costs and benefit analyses** of SCP initiatives and of risks associated with unsustainable production and consumption patterns
- Identify a **high level institutional home of the SCP strategy**. This may take the form of a government

agency (not necessarily within environment line agencies, but perhaps within economic or industrial development agencies) and/or a coordinating platform (e.g., a high level interagency task-force) – this is further explored in section 4.2.

- Establish **effective communication strategies** able to produce public response to policy change and even to pioneering achievements in niche sectors: the latter can help building momentum to scale up initial success.
- Support an effective process of **dialogue and policy review** about SCP initiatives and achievements, fed by adequate evidence of impacts and challenges, and leading to gradual adaptation of strategies and interventions.
- Maintain a clear focus on **economic incentives and benefits**, as well as on private investment and public funding opportunities.

Figure 4:1 Tips to strengthen policy-makers involvement throughout the policy cycle



Source: (Adapted from Müller et al. 2011)

Promoting SCP towards the strategic centre of policy-making

Given the complexity and multi-sector nature of the SCP agenda, it is important to ensure that SCP policies are integrated and reflected in sector strategies and policies and moreover in cross-cutting development strategies. This can help minimise the risk of making the SCP agenda a marginal one, easily overcome by stronger development forces.

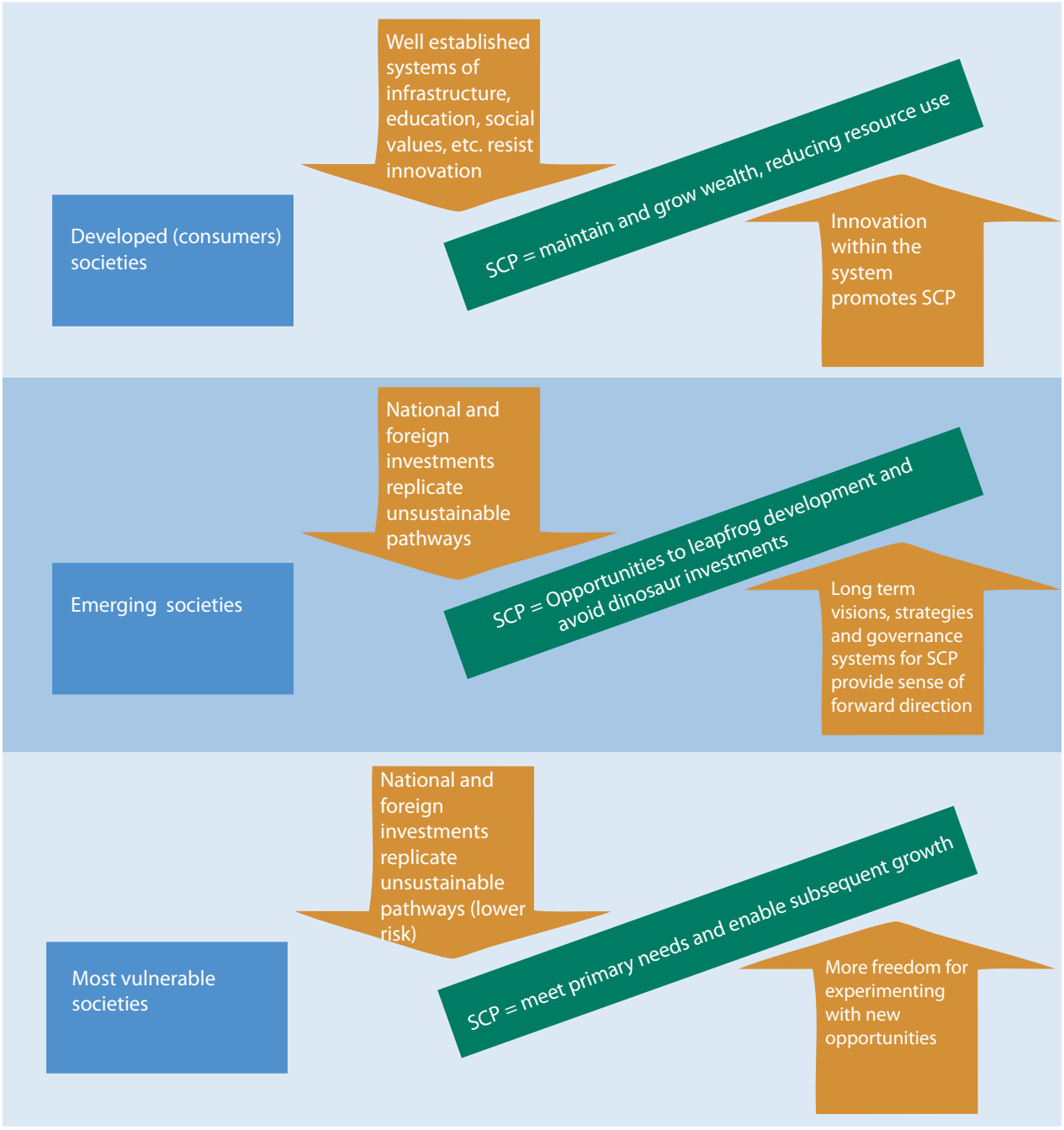
Beyond the general principles of sustainability, SCP goals can be pursued only according to objectives and strategies that make sense in each society and economy. They need to take into account the development stage of a given economy, its trajectory, history and drivers and the underlying social realities and aspirations. This does not mean that only developed societies can afford SCP. It may actually mean exactly the opposite, as we shall briefly explore.

In developed economies, SCP strategies usually pursue innovation and change in sectors where they have to overcome resistance offered by well-established investments (physical ones, like infrastructure, or immaterial ones, like knowledge and expectations). On the other hand, in developing countries and particularly in emerging economies, opportunities may exist to leapfrog development, i.e., to pursue innovative and sustainable solutions without the need for costly restructuring. However, such innovation inspired by SCP models needs to win over the tendency of replicating investment strategies from developed countries. Similar opportunities can also exist in so called bottom-of-the-pyramid societies. In such societies, business models imported from

developed countries are often not feasible: there can be more room to experiment and later scale-up innovative models (once these may prove to be capable of addressing unmet basic needs of the population) (Tukker, 2005). For the above reasons, in developing economies there is a further critical justification to move the SCP agenda towards the central strategic areas of policy-making: it can open up opportunities to provide direction towards more sustainable and resilient development trajectories.

Therefore, to seize these SCP opportunities and counteract the tendency of replicating strategies which have already proven unsustainable in developed countries, it becomes imperative to provide long term vision and coherence to the development agenda. This means embedding SCP policies in mainstream sector and cross-sector strategies and policies.

Figure 4:2 Key drivers and sources of resistance for SCP in different societies

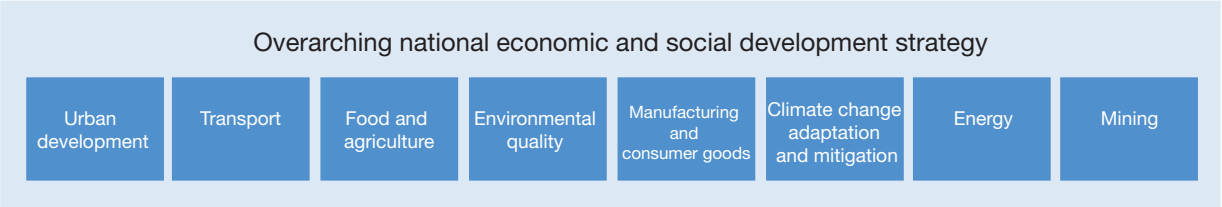


SCP policies can be integrated in major national level frameworks and strategy documents, such as the National Sustainable Development Strategy or National Environmental Action Plan. Furthermore, they can be reflected in

Poverty Reduction Strategy Papers or Millennium Development Goals Strategies. Their respective policy cycles can offer opportunities to review strategies and approaches through an SCP lens and to reflect relevant SCP goals and targets. This approach, rather than the approach of developing a stand-alone SCP framework, can provide prospects to strengthen the sustainability and resilience of mainstream economic and sectorial development strategies.

Within these overarching frameworks, sectorial or issue based SCP plans can drive change and provide vision to specific sectors: they usually consist of action plans with specific objectives, targets and monitoring mechanisms (Figure 4:4).

Figure 4:3 Typical hierarchy of SCP policy levels



However, top down and over-ambitious SCP strategies are unlikely to succeed. Issue and priority selection needs to be guided by pragmatic considerations and coherence with the specific conditions of a given country. Typically, most countries have initially focussed on environmental quality and pollution control measures. With experience and learning through the policy review cycle, countries may later pursue more ambitious goals in terms of life-cycle approach to SCP and complex integration of measures across production systems.

Within this experimental and learning approach to SCP policy development, specific SCP programmes can be formulated to provide opportunities to explore innovation and reach initial achievements, even though this may happen in economic niches. Inventories of SCP needs, opportunities and initiatives (Box 4:2) can provide initial benchmarking on which to build more structured sets of interventions. The review of such programs at medium-term intervals, e.g., through a five years cycle, can offer opportunities for experimental learning and policy review and adaptation. This process can lead to further integration in sector wide approaches and mainstreaming of SCP into economic development planning (Figure 4:5).

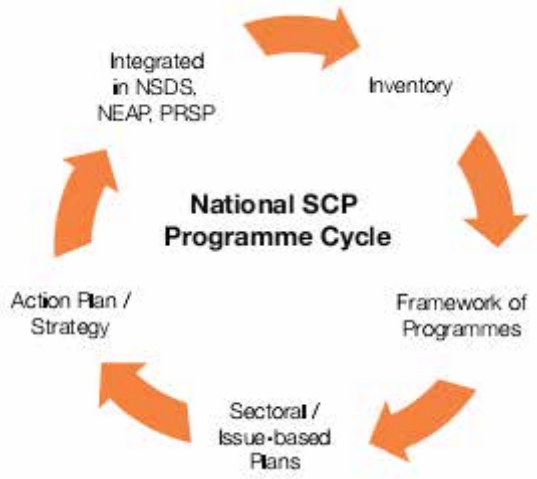
Box 4:2 Guiding questions for SCP programme priority selection

Guiding Questions

- What are the environmental, economic and development priorities in the country?
- What SCP areas have been covered by existing policies, instruments and regional, national, subnational and sectoral activities and initiatives? The plans, policies, processes, strategies and implementation measures identified during the institutional mapping will provide guidance in answering this question.
- What areas were covered by discontinued policies or completed activities?
- What have similar countries used as their priority areas?
- What areas would be the most challenging to implement?
- What important areas have not yet been covered?
- In asking these questions, it is also useful to explore the following:
- What SCP areas and opportunities will be easiest to implement early in the mainstreaming process?
- Which people, groups or institutions have the greatest leverage or influence on the system? These may include politicians, researchers, media, technocrats, consumer groups and the private sector.
- Which processes are currently under development or review and provide opportunities for intervention?

Source: (UNEP 2009)

Figure 4:4 National SCP programme cycle



Source : (Bentley 2008)

In the end, there is no single pathway towards mainstreaming SCP into economic development. As a possible conceptual model (Figure 5), we can consider that the reform agenda needs three broad pillars to unfold:

1. A process of action-learning (which can be facilitated by SCP programmes) which can help establish momentum, identify and pursue opportunities, test new systems and develop strategies;
2. A process to support policy formulation, implementation and gradual mainstreaming;
3. A process of mobilising resources and building capacities to support implementation which fits the national context and needs, and further enables monitoring and policy review and adaptation.

Figure 4:5 The program, mainstreaming and implementation continuum

Establishing SCP momentum via programs	Mainstreaming SCP	Implementation
Identify SCP priorities and opportunities	Identify policy options and measures	Establish policy M&E system and capacity
Find entry points in the policy process	Gather country specific evidence on SCP costs and benefits	Adequate resourcing of policy implementation and M&E
Assess capacities and needs	Identify priorities, sequencing and promote vision	Link to budget allocation process
Find champions of change	Build capacities within institutions	Strengthen insttutional framework for policy review, adaptation and implementation cycle.
Build public awarness	Identify avenues to influence mainstream (secto or economic) development strategies	
Gather evidence of impacts		

Source : (Adapted from UNEP 2009)

Mainstreaming and integrating SCP in the national policy framework can be strengthened through the following approaches:

- Minimise the risks that a proliferation **of action plans** may fragment the focus of attention and weaken momentum. Plans and targets need to be commensurate with the political momentum and implementation capacity, especially with regard to inter-agency coordination.
- **Lack of monitoring mechanisms** for policy implementation hampers the policy feedback and the possibility of developing SCP framework in a gradual and experimental manner. With the growing complexity of SCP policy options (from regulatory guidance, to fiscal incentives to public awareness etc., Chapter 3.2) gathering evidence from policy implementation can be challenging.
- Monitoring enables evidence based **policy review**. The lack of a robust policy review system undermines both the gradual development of the SCP agenda and the progressive ironing out of conflicts which may exist among laws and plans as a consequence of SCP-led innovations. Line agencies and stakeholder clusters need to produce over time shared understanding and approaches towards SCP. Capacities within the public and private sector need to be built to meet policy goals. All these processes require time, sustained effort and above all, a feedback system.
- Enabling **adequate public communication strategies** may counter the risk of a weak demand side for SCP and therefore of a weak economic and political momentum towards sustainable solutions.
- Strengthening **resourcing and addressing capacity constraints** (human resources, knowledge, skills, tools, and networks) may ultimately sustain policy implementation, underpinning the momentum towards mainstreaming.

4.2 Structures and processes for policy implementation

Introduction

Policy implementation relies on structures and institutions and their roles and interaction. Government ministries in many cases have very limited resources for reaching out to society, especially to rural and remote areas. Implementation institutions properly staffed and equipped with sufficient resources, can play a key role as a link between the central government and on-the-ground projects and activities. Sub-national levels of government, such as municipal authorities clearly play an important role and need to have appropriate capacity and sufficient resources for effective policy implementation.

On the other hand, there is a limit to what governments can accomplish by themselves and hence there is a need to form partnerships with key actor groups. Stakeholder engagement and partnership are needed, depending on context, to guide choices, support visions and transitions and promote consultations and negotiations. Partnerships may assist with data collection, research, implementation and resource mobilisation and may be helpful for developing and testing pilot initiatives. It is paramount to engage with the business community, civil society groups and other non-governmental organisations such as consumer groups and the media. Adequate communication and education to all parties, including the community can increase the likelihood of successful implementation.

Building a governance system for the SCP agenda

The overarching SCP framework and sector-wide SCP plans or strategies need to be supported by a coherent governance system, that is the definition of institutional roles and responsibilities required to achieve an effective implementation. This system is the institutional architecture that translates strategies into actions and provides feedback for policy review. It should also be able to guide not just public choices (e.g., within the government sphere) but also private national and foreign investments.

A recent review of the status of SCP in Asia (CSIRO and IGES, 2012) has shown an abundance of national policies, laws, regulations and programmes to support SCP. A key challenge remains the effectiveness of policy implementation, especially at state and local level. Reinforcing implementation is today often more important than formulating new policies.

A key factor is the degree and effectiveness of **central coordination**. As mentioned above, the identification and promotion (via legislative acts or planning decisions) of a central SCP coordinating agency within government is often paramount. This agency may not necessarily be within the environment sector, but can be also placed more centrally within the economic planning functions of government (e.g., President's or Prime Minister's Office, Ministry of Finance, Ministry of Planning or a special commission). Adequate resources, staffing and capacities to ensure a coordinating and policy guidance role are needed. This central node should play a lead role in supporting the SCP policy cycle.

The central coordination function needs to **support horizontal and vertical engagement**, both within the public administration and across wider stakeholders. Several mechanisms have been utilised to this effect:

- Regular roundtable meetings to facilitate the sharing of knowledge and information, developing a common set of standards and criteria to avoid conflicting policy objectives.
- Policy review forums to present and discuss evidence generate by SCP monitoring systems.
- Technical backup agencies (e.g., National Cleaner Production Centres) ideally embedded in existing institutions to ensure long-term viability and proximity to stakeholders' needs.
- Steering groups or advisory committees for specific SCP initiatives and programs can link central government agencies with local government and stakeholders and provide a direct connection between implementation and policy review.

Local government can also play a key role, depending on the decentralisation and devolution context in each country. Opportunities may exist for local government to pursue innovative solutions in given economic and regional clusters. The proximity of local government to economic actors and/or its role in setting up local regulatory frameworks, services and resource allocation can facilitate experimentations and testing of innovative ideas. If successful, these may be scaled-up through policy review mechanisms. Local government can lead specific SCP programs and provide feedback to central Government via association with the agencies responsible for SCP coordination. To achieve this is obviously essential to decentralise functions with sufficient resources (staff, knowledge, tools, and systems).

Box 4:3 Examples of local government role in SCP implementation

- In a Chinese project to enhance eco-friendly pro-poor bamboo production supply chains, the Sichuan Provincial Forestry Department supported SME capacity development by establishing cluster support centres, supporting study tours and policy dialogue with other provincial and national government agencies.
- In the Philippines, the introduction of a scheme to promote zero carbon tourism resorts has been facilitated by the multi-sector Palawan Council for Sustainable Development: this, acting directly under the Office of the President and in close coordination with the line agencies, implements a clearing system for new resorts. This system was established as a pioneering initiative through a national Act specific to Palawan.
- In Rayong, Thailand, the city government adopted an integrated plan for a community-based waste management scheme including recycling, production of organic fertiliser, and production of biogas to generate electricity. It led the project with national and international partnerships.

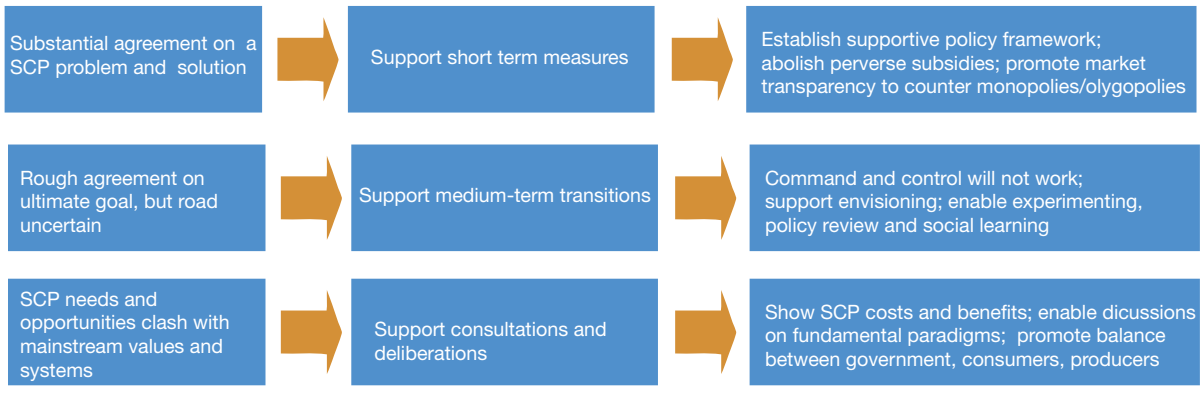
Source: (Muller et al 2011 & IGES 2010)

Reaching out to the wider society

Shaping and pursuing SCP goals and strategies cannot be left to government alone. Government's outreach capacity and mandate in the market place are constrained in different forms: from resource availability to the often prevailing view that consumer choices should not be closely led. Furthermore, SCP agendas are not linear processes in pursuance of universally agreed values: in each society, they are affected by value systems, market factors, geopolitical factors, etc. Specific SCP goals and strategies, therefore, may find themselves in variable relation with mainstream values and forces. They can be contested among stakeholders.

Figure 4:6 summarises three potential situations of SCP goals vis-à-vis social values and systems. We can note how, depending on the specific context, government action may pursue different strategies, ranging from guidance, to transition management to public consultations and deliberations. All these forms of interaction will require consistent mechanisms to engage stakeholders: these include market actors, public bodies, consumers, research institutions, etc.

Figure 4:6 Approaches to SCP in relation to social contexts



Source: (Adapted from Tukker et al, 2008)

The first case is represented by those more linear situations, where there is a reasonable degree of consensus on SCP goals and merits, **partnerships** between government, research and development institutions, and market actors have a direct operational relevance in the policy cycle. The aim of this engagement includes fund mobilisation to support innovation (e.g., research, pilot implementation, knowledge transfer, etc.); gather evidence from implementation; and feed policy review and learning.
Partnership may take different forms:

- Coordination platforms for projects supported by a SCP programme.
- Engagement of influential institutions in advisory platforms, to support policy review.
- Operational agreements between research institutions and business associations.
- Associations of SCP initiatives to mainstream policy implementation and review processes, such as climate change mitigation, trade negotiations, etc.

A second situation refers to conditions or sectors where there is prevailing agreement on the social or environmental goal. However, there is no easy and straightforward solution available to reach there. Here, there is a need to support broad transitions, for example in production sectors or consumption patterns. Experimentation, learning and adaptation can foster social learning towards the goal. There is a need to identify practical and effective ways of engaging business and other social actors through partnerships and collaboration in SCP.

It is particularly important to appreciate how **innovation and change processes** take place. This varies from country to country and from sector to sector with regard to the role of government policies and funding; that of private sector R&D; public research institutions; local versus regional and global networks linking research, testing, development and application; and the role of local and global consumption in creating demand for innovation and change in production.

However, we should not lose sight of two general patterns: innovation is growing fast in Asia, especially in emerging economies; and partnership and networking, in different fashions, are core engines of innovation (Leadbeater and Wilsdon 2007).

In the third general situation, a society needs to reach an agreement on the SCP goals. Costs and benefits may not be self-evident and need to be made explicit and communicated. Mechanisms for wide consultations with the business community and the public can be rolled out. Among the many partnerships and networks involved, **consumers' associations** are partners of choice. They typically support evidence based policy review, advocacy, public campaigns; foster information sharing and international collaboration among civil society actors; produce and track international guidelines and best practices.

Supporting the reform agenda with communication and public education

Policy implementation needs to leverage adequate **communication strategies**. These need to be tailored to a range of target groups, through specific communication approaches and means (Figure 4:7).
Communication can :

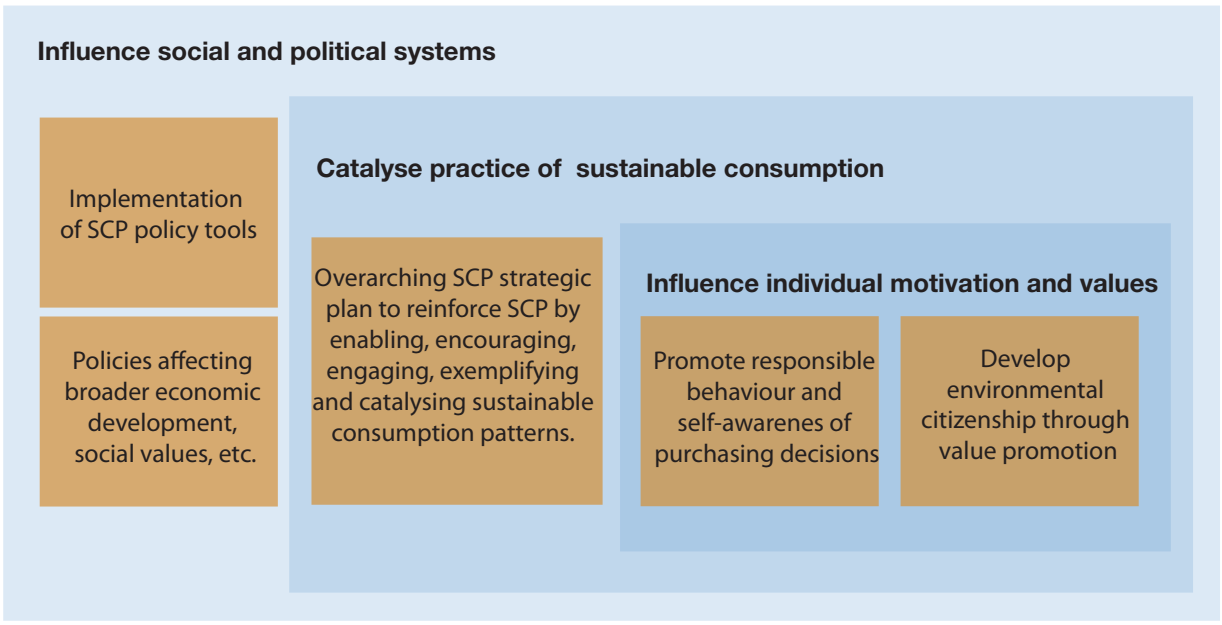
- Assist public officials (at central, regional and local levels) and partners directly involved in SCP initiatives, to increase the understanding of SCP and support coordination and effectiveness.
- Reach out to market actors, to support engagement across value chains and the identification and seizing of opportunities.
- Target the general public, to increase support to SCP policies and awareness of consumption and production patterns and SCP opportunities.

Figure 4:7 Options for communication strategies for key target groups

A consistent communication strategy for the general public and market players is particularly important in those complex and frequent situations where there is a gap or conflict between SCP goals and opportunities on one hand, and social values and systems on the other hand. In these cases, demand side management via communication and media is paramount to incentivise progressive consumer action. Consumers' behaviours are affected by factors playing out at multiple levels: from practical opportunities and needs to self-awareness and individual value systems, to the way individual choices are shaped by institutions and rules, to the broader set of social and economic factors shaping societies.

Therefore, an effective approach to **public education for sustainable consumption** needs to support actions at these multiple levels. Figure 4:8 provides a conceptual model for this undertaking, identifying three layers of factors affecting consumers' behaviour: a background level shaped by social, economic and political factors (this can be influenced via the SCP policy cycle and broader economic policies); a strategic planning level (where SCP strategic plans, practical opportunities and means, can reinforce and link policy implementation with the individual behaviour level); and finally a level acting on personal motivation and choices (where activities like public awareness campaigns can affect personal value systems and purchasing behaviour).

Figure 4:8. A multi-layer model of education for sustainable consumption



Source: (Based on IGES, 2010 which provides detailed guidance)

Further reading 4

Planning for change, Guidelines for national programmes on sustainable consumption and production provides an introductory framework for developing SCP programs through the policy cycle. It focuses on programs design and elaborates on the importance of coordination and high level support.

Bentley M 2008, *Planning for change. Guidelines for national programmes on sustainable consumption and production*. UNEP, Paris.

Leapfrogging into the future: developing for sustainability presents in a concise form, the three general situations of relationships between SCP goals and social values and systems as referred to in the above text. It further argues the need for a careful adaptation of SCP policies to the reality in each given country

Tukker, A 2005, 'Leapfrogging into the future: developing for sustainability', *International Journal of Innovation and Sustainable Development, vol.* 1, no. 1, pp.65-84. Available from: Environmental Expert [12 September 2012].

Mainstreaming sustainable consumption and production and resource efficiency into development planning presents detailed guidance on mainstreaming SCP goals and strategies throughout national planning systems. It is designed for officials involved in policy making and SCP practitioners. It covers the design of SCP policy measures and strategies to reflect them in mainstream development frameworks.

United Nations Environment Programme 2009, *Mainstreaming sustainable consumption and production and resource efficiency into development planning*, UNEP, Paris.

Capacity Building and Policy Needs Assessment for Sustainable Consumption and Production: Executive Summary is a recent report that provides an updated assessment of the status of SCP in Asia. It considers policy formulation, implementation capacities and lessons learnt from the first cycles of policy development and program implementation across the region.

CSIRO & IGES 2012, *Capacity Building and Policy Needs Assessment for Sustainable Consumption and Production. Executive Summary*, UNEP SWITCH Asia Policy Support, Commonwealth Scientific and Industrial Research Organisation & Institute for Global Environmental Strategies. Available from: <http://www.switch-asia.eu/fileadmin/content/PSC/AssessmentSummary.pdf>. [15 August 2012].

Sustainable Consumption and Production in the Asia-Pacific Region. Effective Responses in a Resource Constrained World provides comprehensive guidance to several key aspects of policy implementation. In particular, it provides detailed theoretical and practical knowledge on public education strategies.

IGES 2010, *Sustainable Consumption and Production in the Asia-Pacific Region. Effective Responses in a Resource Constrained World,* IGES White Paper III 2010, Institute for Global Environmental Strategies. Available from: < http://www.iges.or.jp/en/news/topic/wp3_main.html>. [September 2012].

Advancing Sustainable Consumption in Asia - A Guidance Manual provides a comprehensive review of the drivers and trajectories of the change of consumption in Asia. It further analyses the challenges and opportunities to change consumption patterns from a SCP perspective.

United Nations Environment Programme 2005, *Advancing Sustainable Consumption in Asia - A Guidance Manual.* UNEP DTIE, Paris.

5 Monitoring and Evaluation

5 Monitoring and Evaluation

✓ Excellent
Good
Average
Poor

Key Learning Points

- Policy monitoring and evaluation is an ongoing activity. It is essential for determining the need for extending, adjusting or ceasing a policy.
- Effective policy monitoring and evaluation requires well thought out indicators.
- Some important frameworks exist that can be utilised when identifying indicators and when devising indicators systems.
- Commonly used criteria exist for good indicators, in the context of developing and emerging countries.
- Multilateral Environmental Agreements have been a key vehicle through which SCP objectives have been woven into international platforms addressing broader sustainability concerns.
- The Marrakech Process has, over the last decade, been the main channel for intergovernmental collaboration specifically on SCP.
- In Asia, more cooperation mechanisms at the sub-regional level are being developed to facilitate the implementation of SCP activities.

This section highlights the importance of robust monitoring and evaluation of SCP policies. Monitoring and evaluating should not just be thought of as an after-thought, it is a critical step in the policy cycle that allows for learning and improvement. Guidance is provided, to assist in developing a set of well thought out indicators, for monitoring and evaluating SCP policy.

5.1 Understanding monitoring and evaluation

Introduction to monitoring and evaluation

An adaptive approach to SCP policy demands highly developed systems to gain, distribute and use information to describe progress of SCP policies. SCP policies are interventions in complex consumption and production systems. Policy makers need to make sure these policy interventions are well targeted and yield the desired outcomes. Monitoring and evaluation provides this important information.

This section deals with the monitoring of those interventions. Most importantly, monitoring and evaluation needs to be understood as an integral extension of policy implementation – a routine and central function – and not just an afterthought or add-on to the 'main game' of policy-making (Dovers, 2005). To allow learning to occur, policy makers need to set up a process and design for monitoring and evaluation that is robust, timely and delivers both to the purpose of standard administrative evaluation and the broader learning's that need to underpin the policy process. Policy makers need to consider the data requirements for monitoring SCP outcomes.

Monitoring and evaluation are central elements of the SCP policy cycle. They are particularly important in the context of SCP because of the complexity and cross-cutting nature of the SCP policy domain. This creates a much greater likelihood for policy failures and will present the policy community with a need to design an adaptive policy process that will rely on the results of ongoing monitoring and evaluation processes.

Data requirements for environmental and policy monitoring

SCP policy monitoring is unlikely to be a discrete and tightly contained activity. Policy monitoring will hence require a series of steps for monitoring and analysis. The focus of the activity may change as circumstances change and new knowledge becomes available. This reflects the particular complexity and problems associated with the SCP and sustainability domain, as well as the standard insight of traditional public policy, that policy making is an iterative process. Table 5:1 gives an overview of monitoring implications for two important SCP domains, housing and mobility.

Table 5:1 Monitoring and policy intervention: Introducing SCP in housing and mobility

Substantive issue	Policy problem	Policy instrument	Key interests and outcomes	Monitoring implications
Building energy use and GHG emissions	Increased appliance and air conditioning use, low insulation standards	Carbon tax increasing the costs of electricity and emissions	Reducing energy and GHG emissions of buildings, incentivising building efficiency gains and efficient appliances	Short term: purchase of energy efficient appliances, investment in building insulation Long term: reduction target in energy use and GHG emissions achieved
GHG emissions from private car use	Increased private car ownership, lack of public transport capacity	Carbon tax, tax off-set for fuel efficient private cars, free public transport on main commuter routes	Reduce private transport emissions, increase public transport use	Short term: up-take of public transport and purchase of energy efficient vehicles Long-term: substantial reductions in GHG emission form private transport

The example in Table 5:1 shows that there are several target areas for policy monitoring and hence the data that needs to be gathered will vary accordingly. Data would be relevant in three categories:

1. Policy impact, effect or uptake, measuring the extent to which the policy instruments used to effect behavioural change in favour of SCP are being applied or used.
2. Environmental and/or social conditions, which are sought through the policy intervention. Examples include trends in resource use, emissions, poverty levels and whether they improve through the policies or not. This is the domain of basic monitoring, but which in the case of SCP is closely connected to policy monitoring.
3. Secondary influences, both policy and environmental, which may be affecting the ability of policy instruments to achieve the desired SCP outcomes. Such factors may include pressure indicators, natural environmental variables and policy variables (such as perverse incentives, or countervailing commutations).

It is important that the policy community states clearly:

1. What objectives are being pursued and how progress can be tracked.
2. What measures are being used to achieve such progress and how the success of these measures can be measured in the interim.
3. What other factors might influence achievement of the objectives and how that influence can be identified.

Review and evaluation, and policy change

During the policy formulation and implementation stages of the SCP policy program a review framework needs to be set in place. Working towards an informed evaluation is an essential discipline that will increase the chances that all aspects of the SCP policy will be evaluated. This will include setting dates for a mid-term review as well as a major review. In Asian developing countries these review dates will most ideally be synchronised with the national planning cycles of the 5-year plans.

Government agency staff will most often undertake the policy evaluations and many large agencies already have dedicated evaluation staff. The evaluation also may be undertaken by commissioned consultants and researchers, or by committees of Parliaments, or special commissions of enquiry. For SCP policies, because of the extended policy community and participatory nature of programs, an inclusive approach to evaluation is recommended. This may be achieved through consultation, focused meetings and submissions, or by inclusion of stakeholder representatives as part of the evaluation team. In many cases, the National Development Planning process already has well established evaluation strategies and stakeholder networks to be involved during the evaluation. This puts Asian developing countries in a privileged situation for SCP policy evaluation.

Through evaluation of SCP policies, as is the case with many other policies, governments will ensure accountability and effectiveness in expanding public resources.

Such administrative evaluation may include five strands, underpinned by different rationality, approaches and data needs:

1. Effort evaluation driven by efficiency concerns, examining the quantity of time and finances used for SCP policy programs.
2. Performance evaluation, examining the outputs and outcomes of the SCP policy programs in whatever form these may have manifested (independent of whether the policy goals were being achieved).
3. Adequacy of performance (effectiveness) evaluation, assessing whether the stated policy goals were being achieved.
4. Efficiency evaluation, exploring whether the outcomes of the SCP policy program could have been achieved at a lower cost or effort.
5. Process evaluation, which seeks to draw lessons about process and organisational design.

Whilst administrative evaluation is very important, governments may wish to broaden the scope of the evaluation over time to include multiple interests and organise the evolution process in a participatory manner, to favour long-term policy learning over near-term program efficiency and outcomes. Ultimately, evaluation should inform future policy action regarding whether to:

a. Discontinue the policy because the problem has been satisfactorily resolved.
b. Persevere with much the same policy because it appears to be working although the problem remains and goals have not yet been fully achieved.
c. Substantially redesign policy to address failure to achieve the goals.
d. Redefine the policy problem in the light of experiences gained to date.
e. Policy learning might take different forms as is outlined in Table 5:2.

Table 5:2 Policy learning: forms and purposes

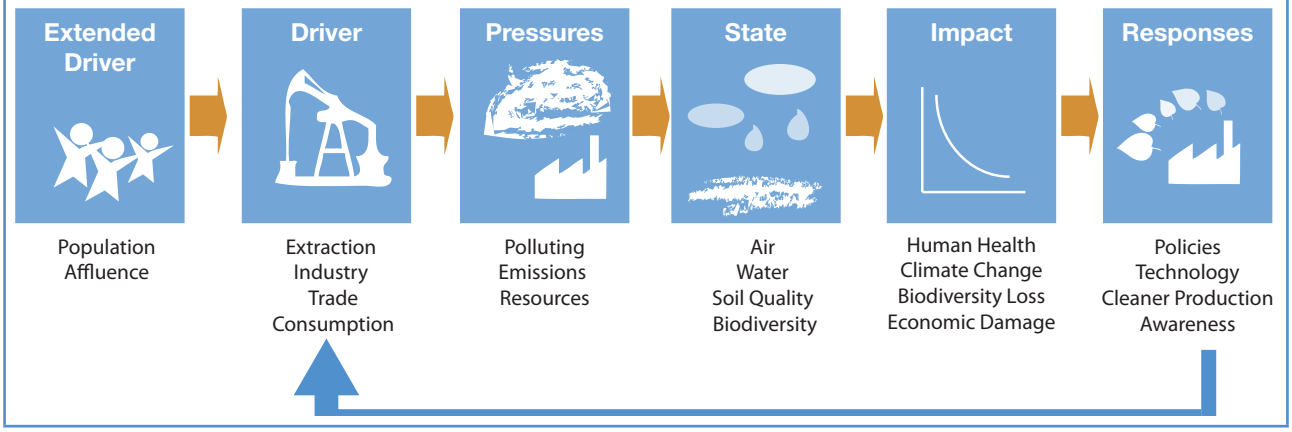
Form	What is learned?	Who learns?	To what effect?
Instrumental learning	How well instruments have allowed the achievement of goals.	Members of the policy network, especially government officials engaged in policy formulation and implementation.	Better design and implementation of policy instruments to achieve predetermined policy goals.
Government learning	How well administrative arrangements and processes have allowed policy implementation.	Members of the policy network, especially senior officials responsible for design and maintenance of policy processes.	Better design of administrative structures and processes within the bureaucratic system (and engaging outside that system).
Social learning	How useful are the social constructions of policies and goals.	Broader policy community, including more and less closely engaged actors within and outside government.	Reframed problems and related goals, through changed cause-effect understanding or altered social preferences.
Political learning	How to most effectively engage with and influence political and policy processes.	Policy actors wishing to (a) change policy agendas and outcomes or (b) defend current agendas and outcomes.	Change in problem definition, policy goals and/or membership of the policy network.

Source: (Bennett and Howlett 1992)

The interplay between the environment and socio economic activities

To facilitate effective monitoring and evaluation it is necessary to structure thinking about the interplay between the environment and socio-economic activities. A variety of frameworks for this exist, one of which is the DPSIR framework, used by the European Environment Agency (EEA). It is a slightly extended version of the well-known "PSR" (pressure –state –response) model introduced by the OECD. DPSIR stands for: Driving forces - Pressures - State - Impact – Responses. This approach can encourage and support decision-making, by pointing to clear steps in the causal chain and allowing for policy intervention to change the causal relations to support environmentally and socially beneficial outcomes. The DPSIR represents a systems analysis view: social and economic developments exert pressure on the environment and, as a consequence, the state of the environment changes. This leads to impacts for example, on human health, ecosystems and materials, which may elicit a societal response that feeds back on the driving forces, on the pressures or on the state or impacts directly, through adaptation or curative action.

Figure 5:1 The DPSIR framework



Source: (European Environmental Agency n.d.)

5.2 SCP indicators

Why do governments need SCP indicators?

Governments in all countries for a number of purposes and in various policy areas use indicators. Indicators convey information about the current situation using a format that is easy to understand. Out of the large pool of statistics and other kinds of data that exist in each country, indicators represent selected pieces of information that are chosen because they highlight areas of key importance for policy making. Indicators can be used both internally by government agencies and for communication with citizens, private enterprises and other actors. In most cases, indicators are quantitative measures derived from national statistics or are based on surveys. SCP indicators will mainly be used for:

Monitoring progress towards a political SCP objective. In this case the government or the parliament has already decided what changes they would like to see happen and indicators are used to see whether or not progress is being made towards that objective. When indicators are used in this way there is often a target to be achieved within a certain time frame. An example could be that by 2015 products meeting certain sustainability criteria should make up 20 per cent of the government's procurement. Such an objective needs to be followed up at regular intervals and if progress is weak stronger efforts may be required.

Monitoring trends in areas of key relevance to SCP. In such cases where no targets have been set, the government may find it useful to follow changes in important areas of consumption and production. Especially for areas of high environmental and social significance there can be a need to keep informed about trends through the use of indicators. Since it's impossible to monitor all aspects of consumption and production patterns and their influence on sustainability, it will be important to be strategic in the selection of indicators.

Benchmarking with patterns of consumption and production in other countries. Comparisons with other countries can be of value in the policy process to identify countries strengths and weaknesses, and areas that require new or stronger policies. However, when making comparisons with other countries it is important to be aware that statistical definitions may differ. Comparing indicators between countries without checking that definitions are similar can lead to erroneous conclusions.

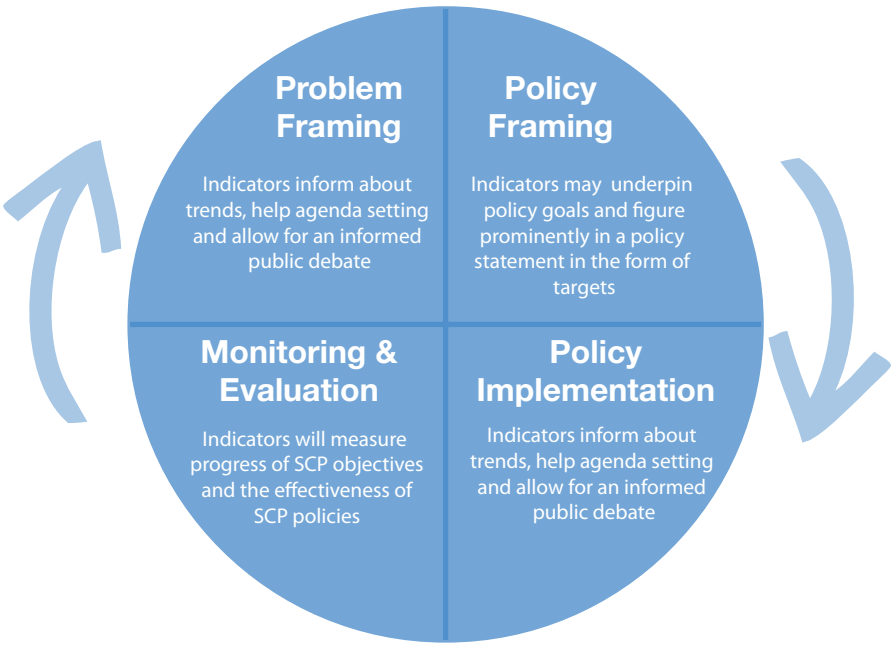
Raise awareness of the importance of SCP and to improve accountability. Selected indicators may be suitable for regular reporting to society at large. They can provide information of how the country is doing, whether it's moving towards more sustainable patterns of consumption and production or not. They may be aimed at informing the general public. Reporting regularly to the public also helps in improving the accountability of policy making.

Indicators can be either absolute, such as hectares of land that is farmed organically, or relative, such as percentage of agricultural output (by weight) produced by organic farming. They can also be composite indices combining different kinds of information into a common metric. An example of such an index is the Human Development Index (HDI), which weighs together data for GDP per capita, literacy and life expectancy.

The information provided through an indicator is simplified and gives a quick indication about situations and trends. The underlying reality is always much more complex than shown by indicators, and policy making typically requires more comprehensive data and thorough analysis of cause-effect relationships. For example, unemployment (in most cases measured as a percent of the active workforce lacking employment) is a key indicator that all governments keep track of. Increasing unemployment is a sign that the government might need to intervene. However, the unemployment rate indicator is just a warning sign; it does not in itself say anything about what has changed in the economy and what kind of government action might be effective. For example: is the increasing unemployment caused mainly by a downturn in the export industry or by weak domestic demand, is unemployment increasing mostly among men or among women, or is youth unemployment going up disproportionately.

The policy cycle can be structured into four main phases (see Chapter 3.1): problem identification, policy formulation, policy implementation and monitoring and evaluation. At all of these stages there is a need for reliable data reflecting the situation in a country. For problem identification and policy formulation, policy makers typically need rich data sets and advisors with good analytical skills. Considerations related with indicators can be of relevance for policy formulation, for example in discussions on new policy objectives it is relevant to think about whether suitable indicators can be devised. For policy implementation and monitoring and evaluation, indicators can also play an important role. High-profile indicators can help with increasing awareness on new policies and their objectives, thereby facilitating implementation. Well-designed indicators should also be able to provide feedback on whether policies are having the intended effect or not.

Figure 5:2 The role of indicators throughout the policy cycle



How to develop indicators: the process

For governments, the process of identifying indicators can help with mainstreaming SCP. The process can help government bodies in charge of different policy domains to form a shared vision on the meaning and objectives of SCP. It can thereby contribute to improved policy coherence. In addition, involvement in the process of indicator development builds ownership and responsibility. Since SCP is a very broad policy field that spans across administrative divisions and needs to involve several line ministries or other governmental bodies, the coordinating/mainstreaming value of such processes can be significant.

In order for indicators to be fully effective, the involvement of civil society, the business community and academia is desirable. Governments cannot make SCP happen on their own. One consequence of this need for active contributions from other actors is that the selection and design of SCP indicators needs to reflect the interest and priorities of other groups in society. Only if the indicators represent a widely held understanding of SCP and related priority areas can they become fully effective as a coordination mechanism and a guiding tool.

Experience shows that the process of jointly developing a set of indicators can have a value that goes beyond that of the indicator set itself. The people involved in the process will increase their knowledge, both about the issues at hand (or the substance) and about the perspectives and ways of thinking of others. This can lay the foundation for improved future collaborative actions towards SCP objectives.

How to structure data and identify indicators that reflect critical aspects

There is a large pool of environmental and sustainability indicators available today that may be employed for analysing a countries SCP performance.

The UNEP SCP indicators approach for developing countries

UNEP has developed an approach for SCP indicators for developing countries (UNEP, 2008) that aims to provide guidance to government departments for selecting their national SCP indicator sets. The framework is based on the notion of five capitals including (1) natural capital, (2) manufactured capital, (3) financial capital, (4) social capital and (5) human capital. These capitals are related but not fully substitutable. In essence, for SCP to be successful in a country, natural capital should not decrease below a threshold of critical natural capital.

The framework identifies 4 important aspects for developing measurable SCP objectives and related indicators. They include the critical natural capital approach and the efficiency based approach as well as compliance and connectivity. According to the UNEP guidance framework, indicators need to provide information that may guide changing behaviours of producers and consumers. They suggest that in addition to a set of macro-economic indicators relating to the SCP performance in a country, it would be important to also develop indicators that reflect the activities of individual consumers and producers in terms of the four perspectives.

Figure 5:3 The SCP compass

Source : (UNEP 2008)

Table 5:3 Mindsets of the producers and consumers

For producers, their mind-set could consist of:	For consumers, their mind-set could consist of:
Compliance – a minimum contribution, where the firm ensures compliance with the law and merely acts to sustain its right to operate.	**Compliance** – where consumers purchase on the basis of price and utility without a sense of influencing producer actions through their consumption choices.
Efficiency – where a firm is prepared to look at changes in products and processes, minimising the throughput of resources (material, energy and water) in both production and product life cycle.	**Efficiency** – where consumers prefer products that have a greater efficiency or reduce resource use and emissions while retaining utility.
Connectivity – where a firm recognises its interdependence on social and human capital and takes steps to build those capitals.	**Connectivity** – where consumers take steps to influence producers through their consumption decisions and recognise that their success will depend on their access to social networks, income levels and self-esteem.
Critical stock – where a firm recognises the need to maintain a critical stock of natural capital and takes steps to restore natural capital or at least avoids its systematic degradation. To achieve this, firms need to trade-off short term financial gains for longer-term resilience.	**Critical stock** – where consumer decisions are focused on the need to retain a critical natural capital stock. They are trading off short-term individual gains for longer-term communal values.

The report outlines a set of possible indicators based on the SCP indicators compass Figure 5:3, which in practice relies less on data for assets (or capitals) and is more based on flow indicators for materials, energy, water and land, waste and emissions accompanied by economic and social indicators.

Another well know framework focussing on changes in environmental assets is the UN System of Environmental-Economic Accounting. The System of Environmental - Economic Accounting (SEEA) framework is a multi-purpose, conceptual framework that describes the interactions between the economy and the environment, and the stocks and changes in stocks of environmental assets (EC, FAO, IMF, OECD, UN & WB 2012). The SEEA framework uses a wide range of information and provides a structure to compare and contrast source data and allows the development of aggregates, indicators and trends across a broad spectrum of environmental and economic issues. Particular examples include the assessment of trends in the use and availability of natural resources, the extent of emissions and discharges to the environment resulting from economic activity and the amount of economic activity undertaken for environmental purposes.

Many approaches based on stock accounting, such as the SEEA, are confronted with the problem of feasibility of data collection. Flow accounts for materials, energy, water and emissions avoid this problem because they are usually based on available statistical data that needs to be modified for the purpose of the accounting methods, but allows for datasets and indicators to be constructed at low costs and within reasonable timeframes. There is now large agreement on the methods to be used for national material flows accounts, for energy flow accounts and for water and emission accounting. These accounting frameworks are usually linked to the System of National Accounts (SNA) and are able to provide data with some sectoral disaggregation and very detailed disaggregation of flow categories.

A set of national SCP indicators

National SCP indicator sets will need to build on the experience of SEEA, DPSIR and natural resource flow accounting (material and energy flow accounting). They will need to be highly complementary to the SNA and need to provide information on production and consumption. SCP indicators, if constructed in such a way, will be largely based on available statistical information but there will be challenges in regard to sectoral disaggregation, which will be necessary to inform SCP policy information. Another important issue would be to disaggregate consumers and households by income groups, geography (urban or rural) and potentially lifestyle factors. The advanced analytical skills that will need to be used to disaggregate data will come from input-output analysis and life-cycle assessment. This will allow prioritisation of economic activities for SCP interventions, i.e. to identify such economic domains where SCP policy interventions would make the largest difference with regard to national SCP outcomes.

Any national (and sectoral) SCP indicator system will need to provide a set of headline indicators along with some more detailed indicators and would profit from indicator dashboards, i.e. sets of indicators that taken together provide information on key aspects of a system. Looking at the indicators together, as a set, should provide an understanding that goes beyond the information conveyed by each individual indicator.

Criteria for quality SCP indicators

- Easy to understand and communicate also to non-experts
- Reflect a widely recognised concern
- Based on conceptually sound calculation methodologies
- Encourage systemic transition/transformation/innovation, not conserve existing structures
- Based on available or easily obtainable data
- Based on reliable data
- Based on data that is updated regularly
- Possible to construct time-series to observe trends
- Sensitive enough to detect changes over the short or mid-term, should provide a reasonably up-to-date picture of the situation
- Be SMART (Specific, Measureable, Attainable, Relevant and Timebound)

For SCP indicator sets an additional criteria is that taken together as a whole, the set of indicators should cover all critical aspects of SCP and provide decision makers with an adequate understanding of whether or not the

country is on the right track to achieving SCP. Furthermore, a good set of indicators should consist of a limited number of quality indicators as too many, or weakly structured indicators can easily create confusion.

The quality of the SCP indicator development process and the participation and degree of involvement of broader social groups will also affect the effectiveness of an indicator set. An open and consultative process is more likely to generate a set of indicators that are widely understood and supported. There is a trade-off, however, between context and country specific indicators and indicators that are comparable across countries. This may be resolved by a common set of headline indicators but country specific detailed indicators.

Box 5:1 Working with indicators in practice

When working with indicators in practice there are a number of things to keep in mind. The following points provide general advice on how to avoid common mistakes and pitfalls.

- Seek to get the indicator set approved at the highest political level. Endorsement from the political level gives an indicator or a set of indicators extra weight and makes it easier to engage all governmental agencies.
- Allocate clearly the responsibility for regular follow-up and reporting. For each indicator, or for the whole indicator set, there needs to be an institution with coordinating responsibility. Changes in indicator values need to be clearly documented and communicated to relevant government agencies as well as to other actor groups, sometimes also including the general public. In cases where progress is weak it is necessary to agree which part of the government is in charge of taking remedial action. If an indicator is not based on information generated by the regular statistics system, it may be necessary to develop new routines for data collection and reporting.
- Be flexible and prepared to revise. Working with indicators is and should be a learning process. There is a value in observing the same indicators over several years, but there is also a need to review and revise indicator frameworks once in a while to properly reflect emerging issues and new priorities. There is thus a need to strike a balance between continuity and renewal. If the reporting of indicators is done annually it might be a good idea to have a more thorough review every five years.
- Analyse trends observed. Seek to understand why changes are happening. This requires adequate resources in terms of staff and skills. Without proper analysis and understanding there is a risk for ineffective or counterproductive policy response. Indicators only tell part of the truth – that is the reason why they are useful, they simplify a very complex reality into a few metrics that can be understood at a glance. However, this is also one of the dangers of indicators: that they highlight certain aspects but ignore others. This underscores the need for regular reviews to make sure that the indicators used reflect current priorities.
- Communicate achievements widely. Use indicators for education and raising awareness and to improve accountability.
- Learn from other countries' experiences and share lessons learnt with others. Collaborate in international networks and platforms.

Experiences from the region

The one single Asian SCP indicator that has gained worldwide attention is the Gross National Happiness (GNH), developed by the Kingdom of Bhutan. GNH was developed in response to dissatisfaction with the conventional GDP measure, which ignores many aspects that are central for people's wellbeing. For example, GDP does not include unpaid work, which plays a significant role in traditional Bhutanese village life where people have a custom of helping each other without expecting any monetary compensation. The government of Bhutan realised that the information it had available through its statistical system was insufficient for measuring GNH. As a result, a special survey tool was developed and further refined over a number of years. The focus on happiness and the approach of directly collecting information from households on aspects related with happiness have inspired a number of other countries, including OECD member countries.

Japan launched a system of wellbeing indicators in 2011. One of the ideas behind the Japanese system is that priorities and concerns shift over a person's lifetime, so that wellbeing in different age groups is related to different contextual factors. What is a significant factor behind the wellbeing of teenagers might have little relevance for senior citizens and vice versa. The system therefore includes indicators reflecting the wellbeing of different age groups. Another feature of the Japanese indicator system is that it covers three domains including socio-economic conditions, health and social relations.

Both the Bhutanese and the Japanese indicators are centred on human wellbeing and factors that are directly linked with people's life-satisfaction. As such, they can play an important role in these countries' policy processes on SCP. However, also SCP indicators of a more traditional kind are needed, for example for monitoring progress in key economic sectors.

The Kingdom of Thailand recently developed an SCP indicator set, which is more comprehensive than the two examples mentioned above but also more traditional in its approach. The indicators used in this system are as follows:

1. Increasing percentage of green procurement per annual budget of government organisations
2. Improvement of the financial system for environmental management
3. Increasing numbers of farms that meet standard (environmental)
4. Area of sustainable agriculture increased at least 5% per year of total agricultural area
5. Increasing number of factory and business enterprises that meet the Green Industry Standard
6. Increasing products and services that received the green labels and other green certificates
7. Increasing numbers of products and services on green tourism
8. Increasing percentage of public transport
9. Increasing percentage of use of renewable energy per non-renewable energy
10. Decreasing national energy elasticity (decrease use of energy per gross production)

5.3 International collaboration for policy implementation and evaluation

Collaboration for successful SCP

Given the broad scope and challenges of shifting established patterns of consumption and production, collaboration – among various stakeholders, at different levels of governance, across sectors, etc - has been very instrumental in towards meeting SCP objectives. International collaboration has sought to establish a shared understanding among governments of the need for SCP, as well as working mechanisms that should help deliver the global objectives. At the regional and sub-regional level collaboration has facilitated a contextual understanding of the specifics of SCP – to provide a working interpretation that reflects the cultural dynamics and behavioural patterns of the region. For example, while in Europe there has been extensive research on European consumer and producer behaviour, in Asia part of the objective of collaboration has been to develop an operational framework for Asia rather than trying to fit it to a European model. This section introduces different forms and levels of collaboration.

Global Collaboration

At the international level, some of the key mechanisms of collaboration have been through multilateral environmental agreements (MEAs), the Marrakech Process and regional platforms addressing different sustainability issues.

The negotiation and implementation of MEAs are perhaps the most established mechanisms of global collaboration in changing existing patterns of consumption and production. MEAs usually have specific objectives, geared towards solutions for a clearly identified issue. Although quite often the MEAs do not expressly mention SCP, the objectives often reflect the cross-cutting characteristic of SCP and the solutions ultimately affect patterns of consumption and production. Some typical MEAs with SCP related objectives include the Basel Convention, the Stockholm Convention and the Convention on Biological Diversity, etc.

Box 5:2 SCP objectives in the biodiversity convention

"For example, signatories to the Convention on Biological Diversity (CBD) recognise that each state bears responsibility for biological resources in their jurisdiction, including the direct and indirect impacts on ecosystems that are caused by resource extraction, production processes, consumption and waste. Decision X/44 on incentive measures, taken at the Nagoya COP, explicitly invited countries to foster "sustainable consumption and production patterns for the conservation and sustainable use of biodiversity". Towards implementation, CBD provides support for establishment of National Biodiversity strategies and Action Plans; provision of information clearing house; and financing through GEF and other partnerships. A recent protocol on Access and Benefit Sharing requires that countries should equitably share the economic benefits derived from access to genetic resources."
Source: (Adapted from UNEP 2012)

Another form of international collaboration for SCP policy implementation has been through intergovernmental processes. Over the last decade, global efforts towards SCP have been mainly coordinated under the Marrakech Process (MP), introduced in Chapter 1. The process has been led by UNEP and UN DESA at the global level, with an active participation of national governments, development agencies, and businesses and other stakeholders.

Under the MP, there have been regional consultations to promote awareness and identify priorities and needs for SCP. For example, the following priorities for SCP were identified through Asian regional consultations under the Marrakech Process: energy, waste and water as critical sectors; poverty as a cross-cutting issue; and as approaches, green public procurement, development of fiscal instruments, resource efficient and cleaner production and greening business and markets. Some regions developed regional strategies and implementation mechanisms with regional and national ownership, which were then endorsed by the relevant regional institutions and countries.

Some of the main mechanisms for international collaboration under the MP were through the Marrakech Task Forces (MTF) – focused partnership initiatives with participation from developing and developed countries. The MTFs networked key stakeholders, developed guidelines for key policy areas, and undertook concrete projects and programmes at global, regional, national and local levels in order to develop and/or improve SCP tools and methodologies. There are seven MTF, all voluntary, and each led by a national government.
At the recent Rio +20 meeting where the 10YFP was adopted, governments requested that the framework should draw from experiences of the Marrakech Process and possibly integrate the related task forces. This presents an opportunity to propose platforms that immediately respond to Asia priorities and further enhance the regional collaboration towards SCP. The following table provides the main objectives and indicative outcomes of the MTFs.

Figure 5:4 Task forces implementing SCP

Source: (UNEP n.d)

Table 5:4 Some Marrakech task forces and selected outcomes

Task force (Lead Country)	Objectives	Related activities and outcomes
Cooperation with Africa (MTF CA, led by Germany)	Supports implementation of SCP policies in African countries, through strengthening existing organisational structures and establishing new ones; and projects for implementing SCP methods in Africa	• Development of an African eco-labelling Mechanism – See http://www.ecomarkafrica.com/ • Development of national/city-wide SCP action plans. • "An Overview of Leapfrogging Possibilities for Sustainable Consumption and Production in Africa". • Collection of "Best Practice in African countries". • Support for mainstreaming of environmental education in schools and universities. • Training courses for governmental organisations on sustainable procurement.
Education for Sustainable Consumption (MTF ESC, led by Italy)	Through mapping, exchanging and networking, it sought to advance Education for Sustainable Consumption (ESC) in formal curricula, and to develop ESC as a support mechanism for realising objectives of other policies.	• A collection of good practices on ESC. • A database and a technical planner on ESC. • Study and analysis on the thematic issue of education (e.g. pedagogic aspects) and the interlinks and interdependencies with consumption patterns. • The development of guidelines and recommendations for the introduction of ESC into formal learning processes: "Here and Now! Education for Sustainable Consumption. Recommendations and Guidelines".
Sustainable Lifestyles (MTF SL, led by Sweden)	Through policies and projects, developed ways to engage, exemplify, enable and encourage people, civil society organisations and governments to further sustainability in people's everyday lives.	• CD-Rom Sustainability Communications - A Toolkit for Marketing and Advertising Courses. • Sister classrooms, a pilot project between USA, Mexico and Costa Rica aiming to develop didactic materials based on a existing curricula, focused on life-cycle and global citizenship. • Training sessions in China and Brazil to assist governments, local authorities as well as NGOs and consumer associations with development of communication strategies and sustainability awareness campaigns. • Website expansion and regional workshops of the UNEP/UNESCO YouthXchange programme, which promotes sustainable consumption patterns among young consumers all around the world. • Project supporting Creative Communities for Sustainable Lifestyles (CCSL).

Source: (Based on UNEP n.d.)

Asian regional collaboration

The recent UNEP (2012) report "Global Outlook on Sustainable Consumption and Production Policies: Taking Action Together" provides an account of collaborative initiatives on SCP at the regional level. A typical example is the Regional 3R Forum in Asia. It seeks to use the concept of reduce, reuse and recycle to bring together ministers of environment for high-level meetings and collaboration, on the problem of growing waste that has paralleled rapid urbanisation in the region.

Several sustainability policy platforms tend to be subregional in geographic focus. Examples include the Northeast Asian Sub-regional Programme of Environmental Cooperation, the North West Pacific Action Plan, the South Asia Cooperative Environment Programme and the Pacific Islands Forum. Other collaboration platforms are more focused on specific issues, such as the Asia Forestry Partnership and the Acid Deposition Monitoring Network in East Asia.

Some platforms of collaboration are created among countries of similar political and economic interests, where transboundary consumption and production issues play a facilitating role. The Tripartite Environment Ministers Meeting (TEMM) has been bringing together Japan, the Republic of Korea and China since 1999 for cooperation concerning climate change, biodiversity conservation, pollution control and transboundary movement of e-waste, among other issues. In 2005 TEMM member countries formed a working group on common standards for environmental labels. Through the working group, the three countries have agreed to develop common standards (for water-based paints, stationery, personal computers and plastics) and to harmonise their eco-labels to facilitate green purchasing with each other.

Another example of collaboration is through research, policy and practice platforms. As in Europe and North America, there is an Asia-Pacific Roundtable for SCP (APRSCP). It was started in Bangkok in 1997 mainly to promote Cleaner Production. However, indicative of the general trend to shift from strictly technical approaches such as eco-efficiency to more socio-technical approaches that include consumer behaviour and psychology, the forum was renamed and given a new focus on the broader subject of SCP. The roundtable is held every 18-24 months, bringing together industrialists, environmental professionals, university academics and researchers, as well as policy makers. The APRSCP conducts training sessions, workshops, and staff exchanges for the purpose of increasing the skills and knowledge of SCP stakeholders, acts as a clearing house for the exchange of data and information on sustainable consumption and cleaner production in the region, maintains a register of professionals involved in promotion of sustainable consumption and cleaner production, and supports development of new country-level SCP roundtables.

Rather than just stand alone, SCP policies and programmes are quite often embedded in broader policy platforms. As an example, recognition for SCP is enshrined in Association of Southeast Asian Nations (ASEAN) key documents, among them the ASEAN Declaration on Environmental Sustainability. The ASEAN Vision 2020, which charts a future for ASEAN countries, aspires for "a clean and green ASEAN with fully established mechanisms for sustainable development to ensure the protection of the region's environment, the sustainability of natural resources and the high quality of life of its peoples". The ASEAN+3 Leadership Programme on Sustainable Production and Consumption was launched in 2008 as a training programme for governmental officials, media and communication officials, youth, and women under the coordination of United Nations University/Institute for Advanced Studies (UNU/IAS) as a contribution towards the implementation of the ASEAN Environmental Education Action Plan (AEEAP 2008-2012). More recently, ASEAN Member States agreed on an ASEAN Forum on SCP (see Box 5:3).

Box 5:3 ASEAN forum on SCP

Recognising the need for an ASEAN cooperation mechanism, Member States formed an ASEAN Forum on SCP in Indonesia in 2011. The Forum is a voluntary policy mechanism that will serve in the following ways:

- Provide a venue for Policy dialogue and collaboration on SCP national and regional strategies, planning and implementation including technical support to AMS.
- Provide a venue for discussions on research and innovation for SCP patterns that can support tailored, effective policy design and actions.
- Develop a resource pool and explore opportunity for capacity building to support governments and other stakeholders at national and regional levels in a transition to SCP, and to support public awareness campaigns on SCP.
- Encourage discussion on emerging issues on SCP between AMS including the development of links with the relevant ASEAN Working Groups to promote cooperation on SCP between AMS and global/regional initiatives on SCP.

The establishment of the ASEAN Forum on SCP showcases the increased political interest of the South-East Asia countries on SCP issues.
(see *http://www.switch-asia.eu/switch-policy/news/asean-forum.html*)

An example of a broader and more practice-oriented mechanism is the Asia-Pacific Forum for Environment and Development, or APFED. It promotes model local initiatives and brings together experts to formulate lessons learned in policymaking and apply them to climate change, biodiversity conservation, the 3Rs (reduce, reuse and recycle) and water management. In its second phase, launched in 2005, APFED has been giving out awards to outstanding projects, funding showcase projects and running events on capacity-building, stakeholder empowerment, governance, technology and finance for sustainability.

Financing for SCP also offers collaboration opportunities. Such is the case with the SWITCH-Asia Programme. It was set up by the European Commission in line with its Strategy Document for Regional Programming in Asia and provides funding opportunities of €152 million over the period 2007-2013. The aim is to promote SCP among small and medium enterprises and support Asian policy makers in shifting towards SCP practices. In addition to promoting specific SCP practices, the projects employ innovative replicating mechanisms such as voluntary agreements, public–private partnerships, and upgrading of technical standards or reinforcement of existing SCP service providers to make countries self-sustainable on the market.

Box 5:4 Three strategic components of SWITCH-Asia Programme:

Through project grants, projects are funded which can produce quantifiable reductions of CO2 emissions and consumption. So far, SWITCH-Asia has funded 47 projects in 15 Asian countries in areas such as greening supply chains, marketing for eco-products, green public procurement, cleaner production, eco-labelling and products for the poor.

The Network Facility provides support for projects funded under the SWITCH-Asia Programme in order to increase the quality and impact of project activities, along with facilitating the uptake of successful results by Asian policymakers.

The Policy Support component, launched in 2010, aims to strengthen the formulation and implementation of SCP policies in Asia. On a regional level this is done primarily through capacity building in collaboration with UNEP. Furthermore, national Policy Support components, managed by EU Delegations, focus on selected countries—Malaysia, Thailand, Indonesia and the Philippines—that have already gathered experience in applying SCP tools.

switchasia
POLICY SUPPORT

Further reading 5

Global Outlook on Sustainable Consumption and Production Policies - Taking Action Together, identifies examples of effective policies and initiatives being implemented worldwide. It reviews 56 case studies ranging from global multilateral agreements and regional strategies to specific policies and initiatives and shows progress achieved in promoting SCP, highlighting best practices and offering recommendations to scale up and replicate these important efforts worldwide. There is a chapter on Asia and the Pacific.

United Nations Environment Programme 2012, *Global Outlook on Sustainable Consumption and Production Policies - Taking Action Toget*her, UNEP, Paris.

Paving The Way For Sustainable Consumption And Production: The Marrakech Process Progress Report: Towards a 10 Year Framework of Programmes on Sustainable Consumption and Production presents an overview of the Marrakech Process, the Task Forces and relevant resources for policy makers.

Marrakesh Process Secretariat (United Nations Environment Programme and United Nations Department of Economic and Social Affairs) 2010, *Paving the Way to Sustainable Consumption and Production – Background paper for the Commission on Sustainable Development, Eighteenth Session*, CSD18/2010/BP4.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Part B :

THEMATIC POLICY OPPORTUNITIES

6 Cleaner and Safer Production

Part B

6 Cleaner and Safer Production

Key Learning Points

- Sustainable (cleaner and safer) production is important in the context of resource use/ management in Asia-Pacific at the level of enterprise, clustered entities and larger boundary production systems.
- There is a need to enhance cleaner production (CP) policies for all enterprises, including SMEs.
- CP policies can address issues in sustainable production.
- Enabling factors for SCP in business exist and can be used for developing policy.
- CSR can both benefit and be a tool to monitor environmental performance of enterprises.

What is cleaner production and why is it important

As the Asia-Pacific region has increasingly become the world's production centre, resource use and consumption patterns have become an issue. Impacts of unsustainable practices (both production and consumption) and utilisation of scarce resources threaten the basis of the economy. The pursuit of economic development for societal advancement in the region currently necessitates increasing resource use and generates more emissions. The rapid industrialisation, urbanisation and population growth experienced by the region contributes to the reality of the need for resource management and green growth. Consequences of growth must be dealt with, or prevented in the first place. One of the most important areas of SCP is the area that deals with cleaner and safer production. Practices and applications for and of cleaner production can be traced quite some decades back and the term cleaner production is relatively older than the term SCP.

Eco-efficiency and Green Productivity

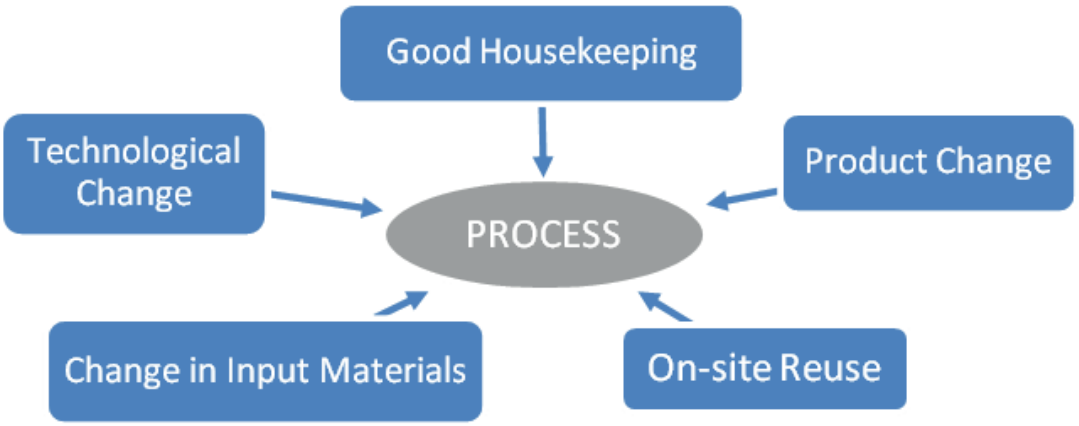
To understand cleaner and safer production it is important to first make consider two areas that are providing the scientific and engineering basis for cleaner and safer production, namely *eco-efficiency* and *green productivity*. Eco-efficiency is a management philosophy which encourages businesses to search for environmental improvements that yield parallel economic benefits. It focuses on business opportunities and allows companies to become more environmentally responsible and more profitable. It fosters innovation and therefore growth and competitiveness. As defined by the World Business Council for Sustainable Development, 'eco-efficiency is achieved by the delivery of competitively-priced goods and services that satisfy human needs and bring quality of life, while progressively reducing ecological impacts and resource intensity throughout the life-cycle to a level at least in line with the earth's estimated carrying capacity' (Schmidheiny 1992). Simply put, it is concerned with *creating more value with less impact.* The concept of Green Productivity, on the other hand, is coined by the Asian Productivity Organisation and it is drawn from the similar integration of two important activities - productivity improvement and environmental protection. Eco-efficiency and green productivity both express clear messages of CP.

Cleaner Production

The term Cleaner Production was defined by UNEP in 1990 as: 'The continuous application of an integrated environmental strategy to processes, products and services to increase efficiency and reduce risks to humans and the environment'. This definition has been used as the working definition of all programmes related to the promotion of cleaner production and still continues to be a valid definition. CP addresses the management of scarce resources which are the inputs to production. CP addresses problems at the source using a product life cycle approach, that considers techniques, process (see Figure 6:1) and service dimensions.

CP heavily adopts the *reduce, reuse, and recycle* (3R) approach in its CP Technology and CP Management approaches. CP programs promote both low hanging fruit and technological innovations and have been successfully implemented for over 25 years. Some examples across Asia are provided in Box 6:1.

Figure 6:1 CP process re-engineering



Box 6:1 CP product innovation across Asia

Good Housekeeping

- Training of employees in good housekeeping practices such as solid waste segregation, using dishwashers and laundry machines at full capacity and using filter/ traps in kitchen sinks resulted in a significant reduction in solid waste and wastewater at the Heritance Kandalama Hotel (NCPC Sri Lanka n.d.).

Product Modification

- Substituting carbon tetrachloride (CTC) with toluene in a pesticide plant in India minimised the health hazard at the workplace, reduced the volume of input, avoided use of ozone-depleting CTC and introduced cost savings (Unnikrishnan & Hedge 2006).

On-site Reuse

- Trung Do Granite Company (Viet Nam) introduced a concrete pond with three-tank filtration/settling system as a means of collecting wastewater streams from burr cutting and sharpening processes. This measure enhanced the recovery of raw material (powder) for reuse and the recirculation of clean (filtered) water (VNCPC 2010).

Change in Inputs

- By switching fuel from fossil fuel to coconut shells, Rathkerewwa Desiccated Coconut Industry utilised waste coconut shells from the process and reduced CO_2 emissions by 900 tons CO_2e (NCPC Sri Lanka n.d.).

Technological Change

- The adoption of existing technology in snack food production phases (extruders, crisping ovens and packaging) enabled Ly Ly Food Industry Co., Ltd (Cambodia) to reduce energy losses and material consumption (CCPC n.d.).

Nonetheless, the confluence of global economic and environmental crisis that has occurred in recent years has consolidated the understanding of the interdependence between our economic and environmental systems and provided a new impetus to international efforts to promote the transition towards more sustainable industrial systems and Green Industry. This has required the broadening of the definition of cleaner production to include resource efficiency which is a key element of the transition towards Green Industry and Green Economy.

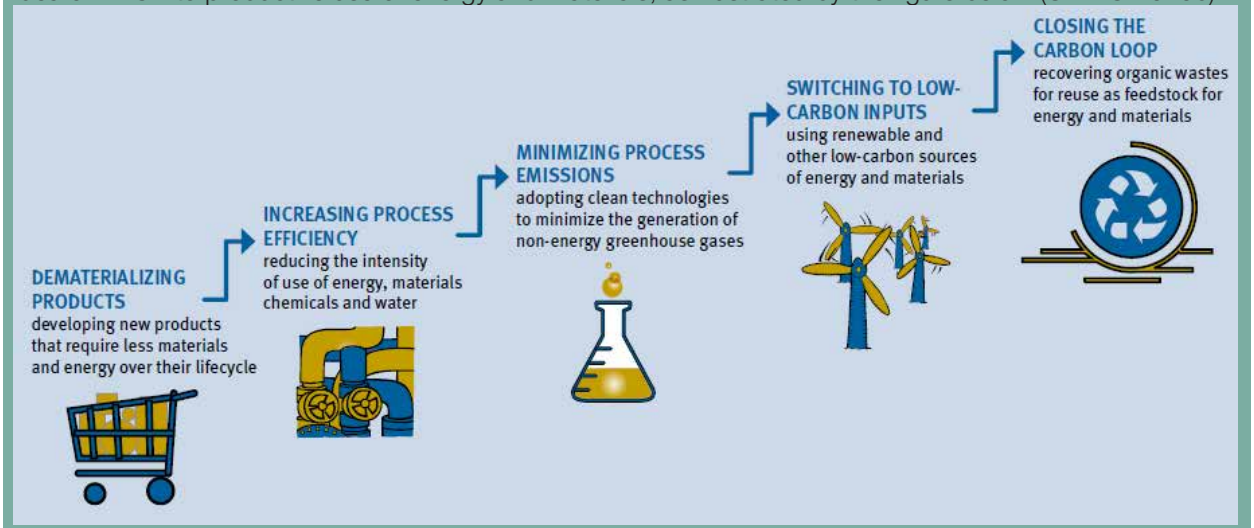
Resource Efficient and Cleaner Production (RECP)

In recent years, as the economic and environmental crises have intensified, UNEP along with UNIDO introduced resource efficiency alongside cleaner production (RECP) to advance production efficiency, environmental management and human development (UNEP n.d.). This strategy integrated the strengthened lifecycle perspective which looks at the point of extraction to the point of disposal, including the critical issue of resource scarcity and the need to upscale CP efforts since 1990.

Involvement in all phases of the product lifecycle allows for RECP to investigate ways to improve the efficiency of production and modify or minimise inputs to achieve triple bottom line sustainable development. Resource efficiency achieves environmental management through the minimisation of waste and pollution. Production efficiency makes business sense as it foregoes the use of unnecessary materials and reduces energy use in producing goods and services. Lastly, humans benefit from the efficient and cleaner processes as it promotes judicious use of resources. RECP reduces environmental impact and pollution by minimising the use of resources to lessen waste within the production system. These strategies, in effect, attempt to exemplify a preventive stance towards environmental management, choosing pollution prevention rather than end-of-pipe treatments. CP measures include adoption of environmentally sound technologies, introduction of process modification and substitution of raw materials.

Box 6:2 RECP for low carbon development

RECP is a fitting approach to low carbon growth as it promotes preventive environmental strategies that increase efficiency and reduce impacts to humans and environment. Low carbon development extends the idea of RECP to productive use of energy and materials, as illustrated by the figure below (UNIDO 2010b).



Safer (and Responsible) Production

An important issue in sustainable production is the safety of environment and humans. The area of safer (and responsible) production '*comprises of tools, guidelines, and management principles implemented at site and local level to ensure both the safety and health of workers in facilities that manufacture, store, handle or use hazardous substances, as well as the prevention of releases of these substances into the environment'* (UNEP n.d.). It ensures an environmentally sound management system that reduces the risks to humans and pollution to the environment. Safer production is a step towards the prevention of industrial/ technological accidents by identifying risks and providing measures to control or manage them. For instance, the European Union has adopted a chemicals risk assessment through REACH policy ("Registration, Evaluation and Authorisation of Chemicals").

Being local-level oriented, Safer Production usually starts with the implementation of Process Safety Management (PSM) or occupational health and safety programs. On the other hand, Responsible Production

is safer production applied along the value-chain. It involves (1) understanding hazards, (2) controlling chemical exposure, (3) reducing accident risks, (4) engaging stakeholders, and (5) promoting chemical product stewardship. The Safer (and Responsible) Production approach includes practical guidance and tools to assist companies in:

1. Identifying and understanding the hazards and risks related to the company products and operations.
2. Identifying opportunities for reducing risk and costs.
3. Identifying and engaging with business partners and communities to improve safety and preparedness for accidents with chemical products.
4. Promoting risk communication and product risk information along the value chain.
5. Training workers and business partners in chemical safety.
6. Improving procurement systems to include chemical safety management.
7. Measuring and communicating performance in a transparent way.

Box 6:3 UNEP APELL Programme

Associated with safer (and responsible) production is the UNEP program called the Awareness and Preparedness for Emergency Response at Local Level (APELL). This is specifically of concern in the chemical industry, transportation, and industrial estate management. The strategy of the APELL approach is to identify and create awareness of risks in an industrialised community to initiate measures for risk reduction and mitigation, and to develop coordinated preparedness between industry, local authorities and the local population.

Industrial Ecology (eco-industrial development)

While CP is an effective eco-efficiency strategy in dealing with production systems at the factory level, there have been attempts to extend the eco-efficient effect to both upstream and downstream stakeholders. Greening the supply chain (GSC) did deliver a significant achievement. However, in many cases, resources were not usable within the same industry chain. A more systemic idea proposed was connected to mimicking a natural ecosystem, wherein all resources are not wasted; they are merely transformed from one element to the other within the system. Applied to the industrial system, this implies that the byproduct or waste from one industry can be utilised as an input in another industry.

Box 6:4 Green industry

In recent years, UNIDO introduced the term Green Industry to refer to industrial development in the context of Green Economy. This concept is built on two premises: (1) Greening Industry - ensuring that all industries improve their environmental performance and their resource and material efficiency, including water, energy and materials and feedstock, and (2) Green Industry - stimulating the development of industries that provide environmental goods and services, and in that context green jobs and technology transfer/ technological change.
Industry must decouple resource consumption from production and reduce environmental impacts; and aiding in this transition is the adoption of management systems and complying with environmentally-related standards for enterprises to stay competitive in the global market. (UNIDO 2010a)

Industrial ecology is a system-oriented study of the physical, chemical, biological and socio-political interactions both within industrial systems and between industrial and natural ecological systems (Chiu 2004a). To be successful this requires a physical flow of resources and information, coupled with multi-stakeholder participation, political will and strategic management. This concept started to gain popularity in 1997 in Asia and the Pacific covering Japan (Eco-town project), the Philippines (UNDP PRIME eco-industrial park project) and Thailand (GTZ eco-industrial estate project). Throughout the 21st century, Asian economies such as China (MEP), the Republic of Korea (KNCPC), Taiwan Province of China (EPA), Australia (BCSD), Sri Lanka (ADB TA) and many others followed suit.

Corporate Sustainability Reporting

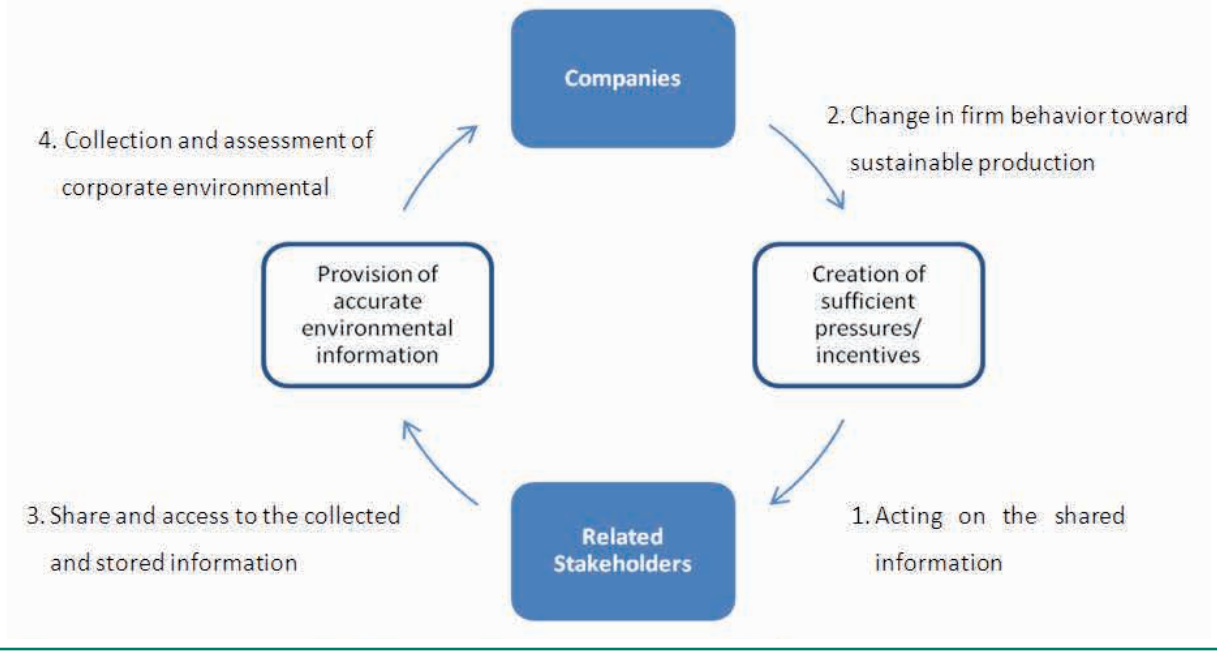
The private sector is not without initiatives on the promotion of sustainable production. In particular, there is a growing trend in corporate sustainability reporting for large enterprises, which often falls under their corporate social responsibility (CSR) program. Corporate sustainability reporting can promote transparency in corporate activities and promote healthy competition among enterprises in sustainability performance, covering information about economic, environmental, social and governance aspects.

Corporate sustainability reporting is a component of corporate environmental information disclosure (CEID) which can take three forms (Rabhi, Shishime, Fujitsuka, Iino & Liu 2010):

1. Type I – Certification of products, processes or management procedures by independent agencies.
2. Type II – Self-certification without fixed criteria or independent outside review.
3. Type III – Provision of raw data, without interpretation or judgment, sometimes in the form of life cycle analysis.

Essentially, the instruments for disclosure of environmental information on products, processes and environmental performance of a corporation are aimed at consumer awareness, enabling them to make more sustainable choices. This creates a feedback mechanism encouraging the suppliers and corporations to be involved in sustainable production, as portrayed by Rabhi et al. (2010) in (Figure 6:2).

Figure 6:2 Procedures for using CEID to promote corporate sustainable promotion



The debate on corporate sustainability reporting now centres on how it can achieve its goal – unifying the many initiatives on standards and legal frameworks to avoid confusion; defining the roles of various stakeholders to hasten its implementation; defining the scope, boundaries and limitations of corporate sustainability reporting and whether or not it should be integrated with financial reporting; and how to ensure a culture of accuracy and transparency in corporate sustainability reporting.

Box 6:5 Global Reporting Initiative

The Global Reporting Initiative (GRI) is a strong advocate of corporate sustainability reporting. Organisations can improve their sustainability performance by measuring, monitoring and reporting it, driving improvement which has a positive impact on society, the economy and the future. The GRI Sustainability Reporting Guidelines enable organisations worldwide to assess their sustainability performance and disclose the results in a standard way similar to financial reporting. A recent report on CSR finds that (KPMG Advisory N.V., UNEP, GRI, Unit for Corporate Governance in Africa 2010):

1. Governments are starting to mandate sustainability reporting and the number of national reporting guidelines or standards have increased.
2. Trends in CSR show a complementary link between mandatory and voluntary reporting. The challenge here lies in determining the minimum mandatory requirements.
3. There is a gradual approach of integrating corporate governance, financial and sustainability reporting into one reporting framework which could facilitate transition to sustainable markets.
4. Stock exchanges in emerging markets appear to play a significant role in promoting transparency and sustainability reporting.
5. Adopting international standards as national frameworks for sustainability reporting can facilitate tracking of performance against international agreements.
6. Proliferation of national and other global standards in sustainability reporting can be conflicting and thought should be given to the goals of sustainability reporting.

Box 6:6 National Cleaner Production Centres

While there have been significant strides in the promotion and establishment of SCP policies in the region from multi-stakeholders, actually implementing them to achieve cleaner production is the challenge. Launching eight National Cleaner Production Centres between 1994 and 1995, UNIDO and UNEP have expanded this programme to 47 countries. In Asia, several national CP centres have been established which have evolving roles from solely focusing on CP issues to transcending to the wider scope of SCP. Operating locally, and collaborating regionally and internationally, NCPCs are able to gain and extend knowledge among themselves and to other countries. China and India were among the first countries to establish NCPCs, while among the youngest are Lao People's Democratic Republic, Cambodia and Indonesia.

The study of Chiu (2009) on NCPCs in Asia shows that all countries that have established NCPCs have extensively enhanced CP law or policies in place. Conversely, the presence of NPCPs can also have a more substantial role to play in the country supporting these two entities.

NCPCs in Asia-Pacific have so far extended assistance to other countries such as Ethiopia, Kenya, Mozambique and Mauritius. The long history of extended CP networks across Asia-Pacific within the UNIDO-UNEP NCPC community has served as a platform for collaboration and knowledge transfer. Establishing a regional platform can serve as a marketing tool – collective marketing – to profile what NCPCs can offer; enhance the resource pool for further implementation and support NCPC eligibility for international projects. The regional platform could serve as a regional think tank for the CP/ RECP strategies, and take advantage of the collective data gathering and higher level participation in global directional meetings, and craft the Asia-Pacific regional mid-term, as well as long-term strategies for individual countries' NCPC members. Support for the development of project proposals to funding agencies such as GEF and EU may be offered by a regional entity to NCPCs. In addition, a regional platform could also assist with research regarding national, regional and international trends to identify mechanisms by which NCPCs can be scaled up to be at par with counterparts.

In terms of technology for CP, indigenous technology in Asia shows promise in addressing local scenarios. For e-waste management, the Republic of Korea is second to Japan to have formal and strong technologies such as material recovery, sorting and pulverisation. Waste-to-energy technologies for recovering heat energy, fuel, and materials were found to be strongly practiced in Japan's eco-town initiatives, China's eco-industrial park initiatives and the Republic of Korea.

Policy options

The CP community played an important role in developing actions and policies on CP in several countries in Asia including China, India, Sri Lanka and Viet Nam. China is the first in the world to have explicitly labelled or used the term Cleaner Production in the Promotion Law, which was followed by the Circular Economy Promotion Law in 2009. It is also important to integrate industrial firms, networks or chains of firms, eco-industrial parks, and regional infrastructure in a broad system to support resource optimisation. There is a need to incorporate long-term sustainable development principles into short-term interventions so that infrastructure investment and economic stimulus policies do not lock economies into a wasteful consumption pattern for the future.

Aside from the evolving role from CP to SCP in the Marrakesh Process/ 10YFP, CP tools also directly reduce the negative impacts that arise from issues such as climate change, biodiversity threats and hazardous chemicals. Chemical management, for example, has been an increasingly integrated part of many CP initiatives currently at demonstration stage and will likely have a higher intensity of integration.
Significant progress on international and regional SCP promotion has been made in the past years. There remain however, many opportunities for improving CP across the region, through the development and implementation of CP and SCP policies. This is further explored below, in the discussion of policy opportunities.

1. Management by Measuring Performance

Asian economies often encounter significant barriers in crafting appropriate policies as there is a lack of good data for critical indicators. Hence, there is a need for establishing databases and clearinghouses for indigenous technology. Both UNESCAP and UNEP IETC have spearheaded data gathering of environmentally sound technologies and indigenous technology documentation and knowledge-sharing.
Much of the resource use intensity and pollution load intensity data was collected by the NCPCs throughout years of CP initiatives in the industry. This data is essential for national economic development planning, as it can be used as input for national policies and the development of performance indicators. Such knowledge-sharing could be the prime asset of the region. There is a need to expedite the dissemination these strategic initiatives.

2. Government commitment to Cleaner & Safer Production as key SCP strategies

The majority of the Asia-Pacific governments have provided support to CP promotion. Many of the NCPCs are housed in government units, national productivity organisations and academic institutions. Asia-Pacific governments are also major signatories to the CP Declaration of the United Nations.

With regard to safer production, there is currently a wide interest from companies and authorities in replicating the APELL owing to its effective approach for preventing industrial accidents. Working groups on safe transport of hazardous substances (including transporters, mining companies and local authorities) could be formed to complement local or national measures.

3. There is a need to explore various CP financing options on green investments

There is a need to translate the policies, programmes and initiatives of the public and private sector into public and private investments in green technology. Public and private investments in green technology can be instrumental in realising widespread CP implementation. The objective is to create momentum for investors in green technology and to emphasise the viability of such investments for sustainable economic growth in Asia and the Pacific.

Good approaches towards promoting financing of CP in Asia, include partnership of financial institutions with NCPCs in Viet Nam, existing CP Promotion Law of China (paving the way for institutionalising funding mechanisms) and regional environmental soft loan windows in the banking industry in the Philippines.

NCPCs in Viet Nam and Sri Lanka have served as good models on supporting SMEs in acquiring financing for CP implementation. Other NCPCs can learn from these examples to further the implementation of CP. Otherwise other options may be taken such as acting as the guarantor or co-assessor in securing financing from banks or encouraging industry to raise funds for CP implementation.

4. There is a need for more participatory stakeholder and expert involvement _

The implementation of RECP is expected to deliver real benefits for the people and would directly deal with change in unsustainable patterns of production and consumption. Such a change necessitates leadership from relevant stakeholder groups and effective change management. Challenges in the change management agenda include weak incentives and high transition cost. Two approaches, namely, scaling-up and mainstreaming can assist in this aspect. Scaling-up would address replicating, streamlining, expanding and innovating. On the other hand, mainstreaming would address public policy, public institutions, market and society. Lessons should be extracted and learned from the change management efforts in the region. Human resources must also cater to the scaling up efforts of RECP. Intensive capacity building efforts to certify experts/ trainers to support RECP initiatives must be ensured to develop local capability and expertise.

5. Development of appropriate resource pricing tools and instruments

Concrete steps need to be taken to 'get the prices right' at the right time by developing and implementing a range of economic instruments to ensure that the ecological consequences of using natural resources and pollution are reflected in the prices. These could be reflected in the form of tax and fees such as green tax, sewerage fees and environmental (use) fees. Many economies began moving towards this direction (e.g. Clean Water Act of the Philippines). This is discussed more in Chapter 11, Fiscal Reforms.

6. Effective CP networks towards Sub-regional / Regional Cooperation and Benchmarking

Cleaner Production has played a key role at the plant-level and sectoral-level since 1980s. In many cases, there are several CP centres within the same country (sub-national, provincial and local) such as that in India, China and Sri Lanka. This can be beneficial as the geographical nature of these countries requires an in depth penetration of NCPC presence in the locality. Incorporating CP with issues related to the provision of basic needs and services and establishing strategic CP alliances with major stakeholders can create opportunities for wider practice. Collaboration at the local, provincial, regional and international levels already exists but should be further strengthened. Examples of such collaboration include regional projects such as SPIN, GERIAP, CP4BP and SWITCH.

South-South and sub-regional collaboration and benchmarking can aid in information sharing and in crafting CP policies. For instance in China, local leaders found that pursuing integrated approaches helped to maximise the economic potential of resource recovery. Scaling up CP strategy especially in coordination with major regional programs such as circular economy (China), green growth (Republic of Korea) and 3R (Japan) can enhance the strength of the CP community, highlighting their lead role in the formulation of CP laws and policies in national governments. This also ensures continuous support by the Asia-Pacific governments to the NCPCs, either financially or in other waiver programs. In addition, China CP and Circular Economy Promotion Laws have been benchmarked by many neighboring economies. Materials flow accounting (MFA) studies in the Philippines and other Asian economies are demonstration tools to assess resource use in the region.

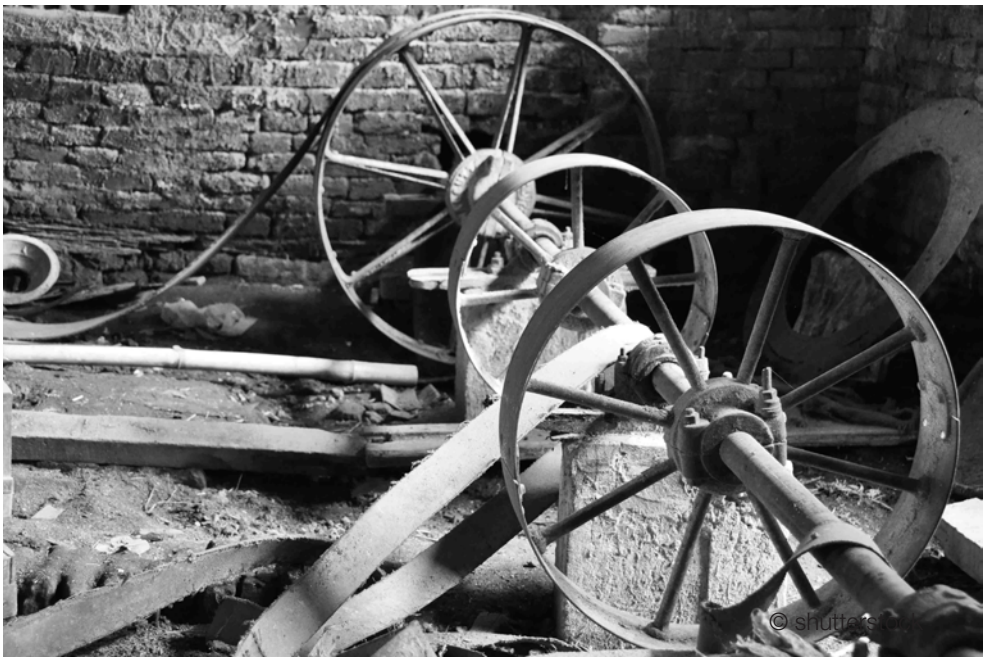
7. Capacity Building for the SMEs in the developing economies

The need for capacity building in terms of human capability, technology knowhow and leapfrogging options should be prioritised in other sub-regions of the developing countries. Production of plain-language "how to" guides for small and medium enterprises in Sri Lanka, for example, expedites industries' awareness on CP benefits. Incentives and technical capacity building can also help promote corporate environmental information disclosure (CEID) among SMEs and assist in sourcing funding.

8. Corporate sustainability reporting as a tool to promote SCP

Corporate sustainability reporting can complement existing legislation on SCP and environmental management. It can be an empowering tool for consumers to stake their rights on sustainable products and services forcing companies to give in to community pressure. Corporate sustainability reporting for companies can be a measure of performance against their competitors. Rabhi et al. (2010) considers that policy encouraging CEID can complement command and control measures for those enterprises working towards compliance, while market instruments coupled with CEID can enhance environmental performance of those already in compliance.

Mandatory implementation can be timely as corporate sustainability reporting gains wider acceptance across regions. For governments, requiring corporate sustainability reporting has the potential to complement existing command and control measures in pollution control. Considering the high cost of such regulatory measures, providing a platform where government can monitor environmental performance of corporations just by obtaining a sustainability report can lessen the manpower and resources required for government regulation. However, Rabhi et al. (2010) cautions that environmental reporting through the broader scheme of corporate environmental information disclosure in developing Asia may be prone to inaccuracy. On the positive side, they observe that CEID serves the interest of companies with poor environmental performance to advance in this aspect. Hence, policy for corporate sustainability reporting or CEID in general should take into consideration the design of existing socioeconomic and environmental policies, the degree of involvement of various stakeholders, economic/ market pressures and the future scenario. Blanco et al. (2005 cited in Rabhi et al. 2010) noted that such voluntary initiatives are driven more by public participation and advocacy in industrialised Asian economies, while compliance with export market requirements are the main influence in taking up voluntary initiatives in sustainable production for less industrialised Asian economies.



Case on China's Circular Economy Law

UNEP defines circular economy as an economy which balances economic development with environmental and resources protection. It puts emphasis on the most efficient use of and recycling of its resources and environmental protection. Features of a Circular Economy include a low consumption of energy, low emission of pollutants and high efficiency. It involves applying Cleaner Production in companies, eco-industrial park development and in integrated resource-based planning for development in industry, agriculture and urban areas.

China has embraced this idea and applied it at on a large scale, from industrial parks (estates) to city levels and on to a provincial/ regional level. Starting with a pilot project involving four industrial parks (Tianjin TEDA, Dalian, Suzhou, Yantai) in 2000, China's CE efforts have blossomed to more than 1,500 (Shi, 2012). China is also the first country to clearly coin CP and CE in the Promotion Laws and to set up indicators for CE demonstration projects. An overview of China's approach for a circular economy is presented in the following case study

The impacts on resources and the environment of the rapid industrialisation and economic growth of China cannot be denied. In 2008, a decision was made to adopt a Circular Economy Law in China to manage the

demands of economic activities to the capacity of natural resources and address the environmental problems that arise from economic activities. CE became a model for the country's development.

In contrast to the CE of Japan and Germany, the Chinese version of Circular Economy focuses on increasing the efficiency in resource flows with particular emphasis given to energy. The China CE Law requires (Xinhua News Agency 2008):

1. Close monitoring of high-consumption and high-emission industries, including the steel and non-ferrous metal production, power generation, oil refining, construction and printing industries.
2. Government departments to map out a system for recycling and improving energy-saving and waste reutilisation standards
3. Industrial enterprises to introduce water-saving technologies, strengthen management and install water-saving equipment in new buildings and projects.
4. Crude oil refining, power generation, steel and iron production plants to stop using oil-guzzling fuel generators and boilers, in favour of clean energy, such as natural gas and alternative fuels.
5. Enterprises and government departments to adopt renewable products in new buildings, such as solar and geothermal energies.
6. Enterprises to recycle and make comprehensive use of coal mine waste, coal ash and other waste materials.
7. Farmers and rural departments to recycle maize straw, livestock waste and farming by-products to produce marsh gas.

To implement this concept of CE in China, Dalian was chosen as a demonstration city. Dalian is a municipality in the Northwest of China and is one of the biggest industrial centres with developed seas and land transport infrastructure. The industrial system in the city includes machinery, electronics, textiles, chemicals, metallurgy and foodstuffs. In addition to being an industrialised area, Dalian is also an urbanised area with environmental issues such as groundwater depletion and water quality deterioration. CE strategies implemented in Dalian include measures to conserve water, materials, energy and land. Geng, Zhu, Doberstein & Fujita (2009) reported on the approach of using CE as a sustainable development model for Dalian, reviewing the way CE was implemented in the site, the progress, results and challenges of the undertaking and formed recommendations for improvement.

First, four key resources (water, land, energy and materials) and three industries (agriculture, construction and services which include tourism) were identified, followed by projects and policies to support implementation. Second, goals were established: resource use efficiency of energy, water, and land; and improving levels of reuse, recycling and recovery of waste and wastewater. Indicators were then established to monitor the progress of implementing planned CE projects. Benchmark values for these indicators were gathered for 2005 and targets for 2010 were set. CE in Dalian City was applied in three levels, namely, corporate (ISO 14001 certification), industry (eco-industrial park demonstration zone) and municipality (eco-city). Lastly, action plans for each resource was prepared. For example, finding new water sources and encouraging water conservation through price or quota mechanisms were introduced and wind and solar energy was tapped. Cleaner production was promoted among industries to reduce material consumption and recycle waste. Industry clustering was pursued to increase land use efficiency.

The challenges and opportunities noted by Geng et al. (2009) include:

1. There are few industry incentives for 'greener' activities. The existence of old heavy industries in Dalian poses a challenge in the achievement of water and energy use efficiency targets.
2. Financial support is lacking. As CE is costly, the government needs to engage other stakeholders such as banks and companies, to provide financial support for CE.
3. Public awareness and participation needs to be heightened.

In response to these challenges, Dalian Municipality (2007 cited in Geng et al. 2009) introduced several measures such as tax incentives for savings in energy and reduction of waste; price reforms to include resource pricing in addition to treatment cost; and incentives for industry using rainwater or saltwater desalination. Other suggestions that can be considered to improve implementation of CE in China based on a study of existing projects revolve around four themes (World Bank 2009):

1. *Improving the effectiveness and efficiency of CE policies* through a balanced mix of policy instruments, including establishing the appropriate regulatory framework, achieving the correct policy mix between command-and-control and market-based incentives, working towards "getting the prices right" and harmonising economic policies.
2. *Enhancing industry and community participation* by actively involving the production sector, local government, community groups, industrial associations and professional networks and NGOs in the process of establishing a CE.
3. *Building capacity for CE implementation* via enhanced training of those responsible for implementation (including representatives of government, industrial groups, and local communities) and disseminating local and international experience with CE and best-practice examples.
4. *Clarifying the role of government and strengthening governance* through establishing high-level leadership for the CE approach, ensuring organisational harmonisation of CE efforts across sectors and ministries and enhancing the accountability of government programs.

The implementation of CE in Dalian City demonstrated successes such as energy and water resource conservation. As a demonstration project, there were a number of challenges and the municipality was able to recognise these and provide countermeasures. While there are still more improvements and opportunities for Dalian, the project illustrates that implementing CE needs to be tailored to local conditions and capabilities, and at the same time it also shows that CE implementation could benefit from a carefully designed policy mix.

Further reading 6

Global Outlook on Sustainable Consumption and Production Policies - Taking Action Together, provides extensive policies, initiatives and 56 case studies on SCP across the globe, offering insights and recommendations on scaling up and possible replication.

United Nations Environment Programme 2012, *Global Outlook on Sustainable Consumption and Production Policies: Taking action together*, UNEP Paris.

Environmental Management for Industrial Estates – Information and Training Resources provides general information on industrial estates, environmental management and industrial ecology that can be of practical use to planning and policy considerations.

Francis, C & Erkman, S 2001, *Environmental Management for Industrial Estates – Information and Training Resources*, UNEP Paris. Available from: <http://www.unep.fr/shared/publications/pdf/3035-EnvironManagIndusEstates.pdf>. [01 September 2012].

7 Sustainable Lifestyles

Part B

7 Sustainable Lifestyles

Key Learning Points

- A critical mass of sustainable consumers can influence the products available on the market and also make it easier to implement policies.
- Sustainable consumption is not just about buying the more sustainable products. Refusing to consume when not necessary and engaging in alternative means of satisfying needs are also important.
- Although in theory consumers have choices, macro factors, production culture, as well as social and physical infrastructure have a much higher influence on consumption patterns.
- Choice editing – what is it and how is it made?
- When is choice editing best used or not used? The role of different stakeholders.
- To what extent is consumer choice guided by advertising?
- Do advertising restrictions work?
- Criteria (economic, social and environmental) to classify products as sustainable at the global and local levels.
- The methodology of sustainable product assessment and the development of product standards.
- Indentifying key roles for stakeholders in developing policy promoting sustainable products and the development of product standards.

Transitioning towards SCP requires a shift towards more sustainable lifestyles. This requires tackling the complex arena of consumer behaviour. The shift towards sustainable lifestyles cannot be left to individual actors, it requires government support through a broad package of policy tools. This chapter explores the role of government in supporting the transition towards sustainable lifestyles, considers what is required for encouraging sustainable behaviour and details policy options such as choice editing, advertising, promoting sustainable products and increasing product information.

7.1 Supporting sustainable consumption choices

Consumption in Asia: Why is it important?

There are four billion consumers across Asia, about 65% of total world population, involved in various forms of consumption and production activities. This is a scale that has influence not only on Asia but also across the rest of the world. An assessment of current patterns of consumption and production in Asia demonstrates the acceleration of material consumption.

The general increase in population in Asia is also coupled with increasing economic growth. This increasingly large group of people need to sustain themselves; in a fast growing economic environment, the level of material consumption per person also increases.

In 2008 the middleclass in non-industrialised Asian economies, defined by the Asia Development Bank (ADB 2010), as those consuming between 2 – 20 USD per day, had risen to 1.9 billion people, or 56% of the population, up from 21% in 1990. The ADB report showed that consumer spending in these non-industrialised economies reached USD 4.3 trillion in annual expenditure. According to the authors, “Asia’s emerging consumers are likely to assume the traditional role of the US and European middle classes as global consumers.” Looking at growth rates among developing Asian economies over the last 20 years, the report extrapolated that at such rates, by 2030 developing Asian countries will comprise about 43% of worldwide consumption.

Among the emerging economies, increase in disposable income has led to more materially affluent lifestyles. China and India now respectively form the world’s first and second largest mobile phone markets. Car sales in these two countries have been increasing at an annual rate of 15% – 30% per year; in India alone the number of annual car sales grew from 0.5 million to 1.5 million units annually. Consumption of home appliances and electronics, fashion pieces, housing sizes and unit space per occupant, car ownership, etc are all on the rise. These are typically urban lifestyles, fortified by a high rate of rural-urban migration. The growing concentration in cities demands many things, including more transportation, more convenient foods (processed and packaged) and more energy. Relocating to urban areas for employment also means that some people maintain two houses – one which is the family house in the village and a second, usually a rented apartment in the city, for work – which is materially more demanding.

But these glowing consumption numbers by the consumer class do not speak to the large pockets of people living in poverty. There is a growing dichotomy of social existence in developing Asia-Pacific countries where, on the one hand, material consumption mirrors patterns seen in the affluent industrialised West, while on the other hand, hard knock poverty blights wide areas of cities with slums and limits well-being opportunities in villages. Economic growth has lifted many people out of poverty, however a large number of people remain under the minimum sustenance line.

Table 7:1 Asian trends in sustainability pressures

Determinant	Asian trend	Characteristic
1. Population	Increasing	High fertility rates across the region, especially among less educated and poor populations; the overall rate of population growth is predicted to decrease in the mid-term future.
2. Economy	Increasing	High GDP growth rates per year; mainly from agriculture and manufacturing – taking advantage of low labour costs, manufacturing of consumer goods (electronics, fashion) sold worldwide has been mostly outsourced to Asia.
3. Rural-urban migration	Increasing	Many young people move to cities to seek employment opportunities; rural areas drained of youth, reducing social virility; urban lifestyles are energy and resource intensive.
4. Consumer-class	Increasing	The so-called 'good life' typified by media images of western-style consumerism now define the lifestyles of the consumer class and aspirations of the poor.
5. Market pressure	Increasing	Innovative ways of stimulating consumption, such as aggressive advertising, credit card use, consumer loans, and rebates after purchase are on the rise.
6. Poverty	Variable	Asia is home to almost half of the world's total poor. They predominantly live in slums in cities and in rural areas (unsustainable livelihoods).

Box 7:1 A dichotomy of social existence: poverty and the consumer class

- Asia is still home to nearly half of the world's absolute poor with per capita incomes of less than US$1.25 a day.
- By 2030, two-thirds of the global middle class is expected to live in Asia-Pacific.
- 578 million or two-thirds of undernourished people in the world are in the Asia-Pacific region.
- Obesity is rapidly becoming a problem in Asia. The number of obese people in China more than doubled over the last 15 years.
- Two-thirds of people who have no access to safe drinking water live in Asia.
- The ground water reserves in Asia are depleting fast. The water table in many large cities, including Bangkok, Beijing, Chennai, Manila and Shanghai, has dropped by up to 50 metres in recent decades.
- Solid waste generation in Asia is expected to rise from 0.76 million tons per day in 2000 to 1.8 million in 2025 despite recycling efforts.

Source: (SWITCH-Asia 2011)

Activity Areas for Sustainable Lifestyles

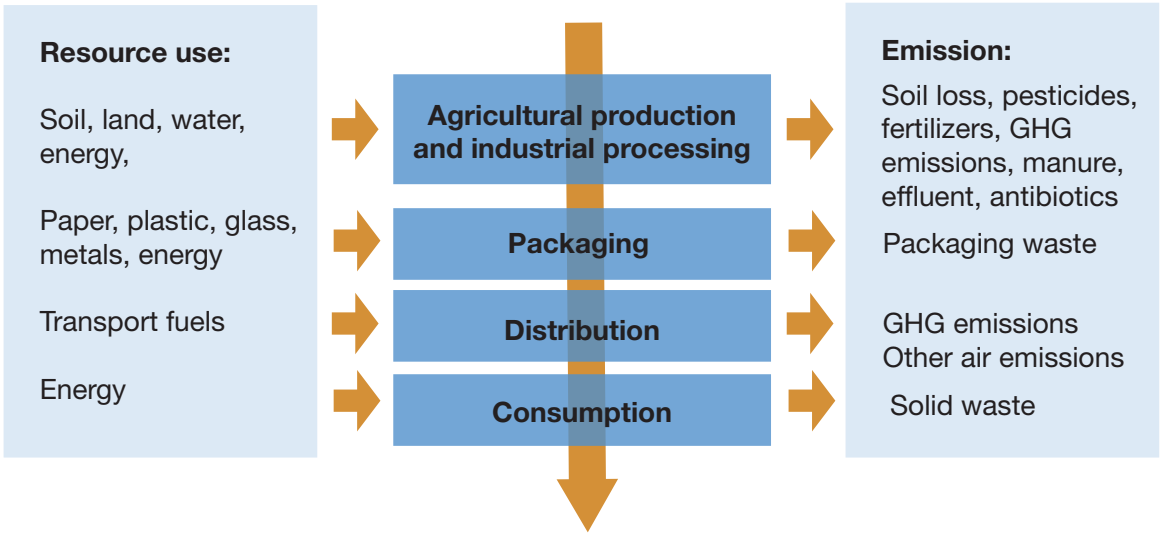
Research combining consumption patterns and life-cycle analysis has identified key areas where consumption has the highest impact on the environment - activity domains and sectors that are responsible for high resource use and pollution and sometimes facilitate social issues. A broad category is consumer goods. This refers to the manufacture, use and disposal of lifestyle goods such as electronics and clothing. Key sectors of high impact include *food, housing* and *transport*. In these sectors, *water, energy* and *waste* can be considered as cross-cutting sectors affecting and affected by almost every lifestyle domain. By changing consumer behaviour in relation to the above, consumers can have a positive influence on the environment; these are the domains that define sustainable lifestyles.

Although a priority order (from the sector with the highest impact to that with lowest) can be established for industrialised countries, developing countries would need further research, data and ecological footprint analysis to determine which sectors have the highest environmental and social impacts. There is however, strong evidence that the above areas are highly relevant to the Asia-Pacific region. Below, the examples of food, housing and transport are discussed.

Food and drinks

What we eat and drink, how we produce it, and how we dispose of it all have impacts on the environment and society. The impacts of food start right back at the production stage, including land distribution and use patterns (including social tension from lack of land titles or land grabbing), use of chemical fertilisers that also kill soil microbes and emissions of GHGs that cause climate change. Food manufacturing and distribution requires energy and packaging. Eating foods with high levels of sugar or fats tend to cause health problems, such as obesity, diabetes and hormonal dysfunction. At the post consumption phase, packaging becomes waste in need of processing and throughout the cycle pesticides from agriculture can leach into water bodies and sometimes into drinking water, causing further health problems.

Figure 7:1 Food and the environment



Source: (EEA 2005)

Box 7:2 Water for life

Water is one of the fundamental supporters of life and a basic commodity for mankind. The Asian continent, which supports about 60% of the world's population, has only 36% share of the world's fresh water resources. In 2012, about 470 million people do not have access to safe drinking water and adequate sanitation; the number is projected to increase to about 3 billion people by 2025.

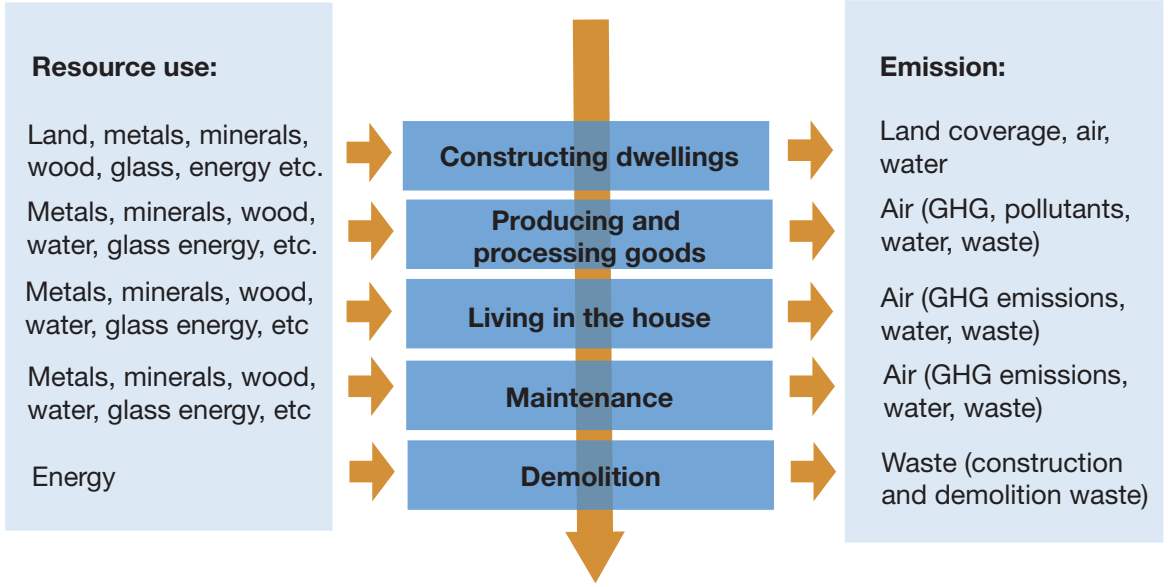
Changing dietary habits by reducing meat and dairy products can significantly reduce the water and energy footprint. Meat production requires a relatively high level of energy, cereal, and water input; and agriculture accounts for 70% of the global water withdrawal. The Water Footprint Network estimates the global average water footprint at 15,500 litres of water for every kilogramme (kg) of beef, 5,000 litres of water for a kg of cheese, 3,900 litres for a kg of chicken meat, and 1,300 litres of water per kg of barley.

Housing and Building Construction

How we live, where we live and what is used to build our living spaces all have social and environmental effects. Building construction requires resources such as sand, wood and metals. Many of the materials require pre processing and some of them are sourced through mining. The mining process alone causes biodiversity loss, deforestation, emissions of GHGs and use of unhealthy chemicals. While living in houses, we use energy and dispose of waste. The way neighbourhoods are built impacts many parts of society, including the rate of crime, the opportunities for neighbours to create strong ties and form vibrant communities and the general well-being

of inhabitants. Finally, at the end of a house's life cycle, the building needs to be demolished, requiring energy and producing waste.

Figure 7:2 Housing and the environment

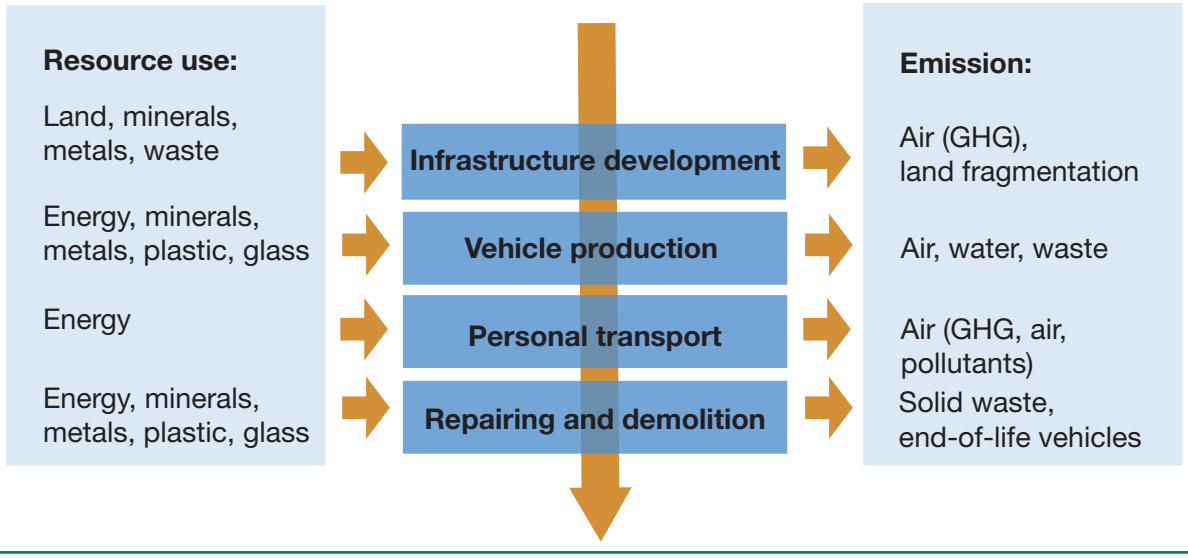


Source: (EEA 2005)

Transport and Mobility

The means of transportation we use to get from place to place, how often we travel, and the distance travelled all add up to have a significant environmental impacts. Over the years, largely due to climate change discussions, there has been increasing understanding of the impact of transport and mobility on society and the environment. The production of motor vehicles is resource intensive; their use requires constant GHG-emitting fuels and the construction of roads; and at the end of life the scrapping of cars takes up space, requires energy and releases harmful substances with potential impacts on human health. Using natural resources and taxes to develop infrastructure for private car use takes funding away from other projects such as the development of social infrastructure, neighbourhood parks and alternatives to fossil fuels.

Figure 7:3 Transportation and the environment



Source: (EEA 2005)

Supporting Sustainable Consumer Behaviour:

The Four-E approach

One of the emerging research-based approaches to assist governments in fostering sustainable consumer behaviour is the Four E's (SDC 2010) This framework was developed by the UK Sustainable Development Research Network, to support the UK Government's delivery on its SD strategy. The 'E's are an easily communicable theoretical framework which can guide a governments approach to "catalyse" change in attitudes and behaviours of people and communities.

To be able to catalyse change, government policy should be designed as a broad package of tools that when deployed, should have enough momentum to break old, unsustainable patterns of consumption and production. Behavioural change takes time. Governments must be aware of this, and to dedicate sufficient resources and sustained effort while following the four E's of Enable, Encourage, Engage and Exemplify, as described below:

1. **Enable access to pro-environmental choice.**

This is to help make it easier for people to become sustainable, by providing them with the necessary tools such as education, skill and information. More sustainable alternatives should be available and easily accessible, as well as suitable infrastructure to make it easier to practice sustainable behaviour. Even well-intended people cannot live sustainably if there are no sustainable products and alternatives available.

2. **Encourage people**

Government should provide signals that show a clear preference for sustainability and encourage behaviour change. These could include peer pressure, putting more taxes on unsustainable options and funding more sustainable practices.

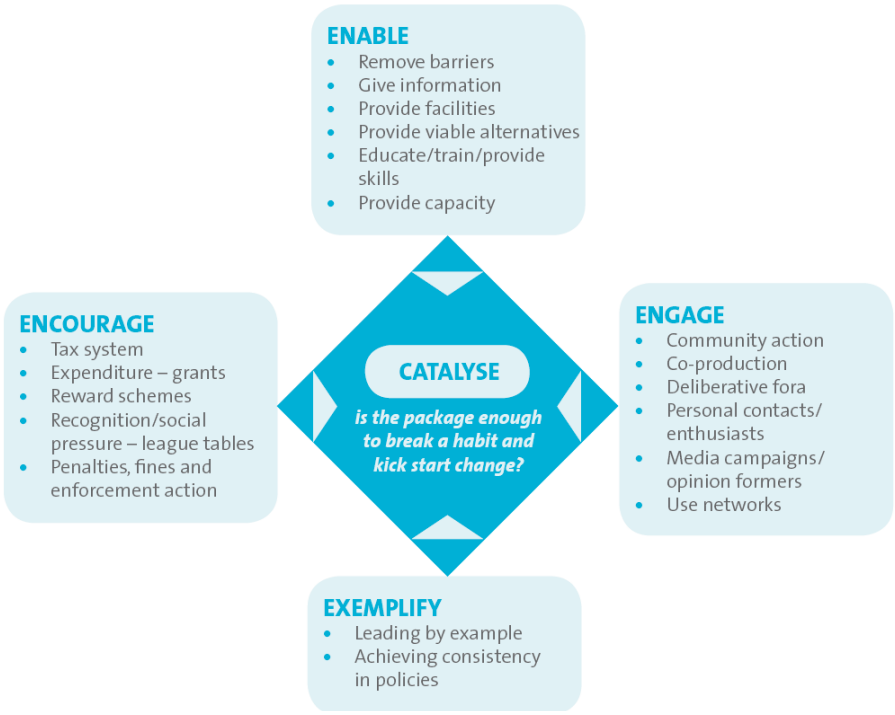
3. **Engage people in initiatives to help themselves**

Government must take deliberate efforts to engage people in the process of change. For example by providing input to policy design, in expressing what is meaningful to them and what they care about in real life and in society, in understanding the advantages and disadvantages of certain behavioural patterns. Research shows that if people feel that solutions are top-down and they are not engaged, they become less active in realising the policy objectives.

4. **Exemplify the desired changes within Government's own policies and practices**

Government should lead by example, showing what it means to be sustainable. Policies such as sustainable public procurement, prioritising sustainable development projects over unsustainable alternatives, training and capacity building on sustainable consumption for government employees provide examples of government leadership.

Figure 7:4 The four E approach to support sustainable consumer behaviour



Source: (SDC 2010)

Box 7:3 Skills for sustainable lifestyles

Competence for sustainable lifestyles can be supported (e.g. by education) through developing the following attitudes, knowledge and skills:

- Ability to define what one considers to be a good quality of life and to be able to identify the values upon which this is based.
- Realisation of the complexity and often controversial nature of sustainable consumption issues.
- Insight into how individual lifestyle choices influence social, economic and environmental development.
- Ability to acquire, assess and use information on the consequences of consumption, particularly on the environment.
- Knowledge of consumer rights and central consumer protection laws.
- Basic knowledge of the market system and the role of business.
- Knowledge of how the production processes are linked to the consumption system.
- Basic knowledge of the interaction of pricing mechanisms with the consumer's attitudes and behavior.
- Insight into the practicalities of both the supply and demand sides of production and consumption and their outside-of-the- market relationships to community development.
- Awareness of a commodity's intangible and symbolic characteristics.
- Ability to recognise, decode and reflect critically upon messages from the media and the market.
- Knowledge of social networks responsible for shaping consumption patterns (peer pressure, status, etc.).
- Consciousness of civil society's power to initiate alternative ways of thinking and acting.
- Individual and collective understanding of consumer social responsibility in relation to corporate social responsibility.
- Ability to manage personal finances (budgeting, saving, investing, taxes and fees).
- Ability to manage physical resources (effective control, maintenance, reuse and replacement).
- Knowledge of conflict resolution in general and in particular in relation to consumer related situations such as product safety, liability, compensation, redress and restitution.
- Ability not only to envision alternative futures but also to create reasonable paths of action leading to these.

Source: (UNEP 2010)

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Table 7:2 Resources from the Marrakech Task force for sustainable lifestyles

Project	Description	Target group
Smart Start Up:	Introducing sustainable lifestyles and sustainable entrepreneurship into African universities and colleges. An education program that combines sustainable lifestyles education with business development skills. Run by universities in Egypt, Kenya, Tanzania, Mozambique, and Mauritius.	Educators Students Young entrepreneurs
Communicating Sustainability	Advice for government on how to produce effective public communications campaigns to facilitate change, based on practical examples and evidence.	National and local governments Communicators
Creative Communities for SL	A collection of inspiring case studies for best-practice grassroots social innovations for sustainable urban living - people are coming together to form “creative communities” in order to solve everyday problems. Examples include responses to challenges in developing countries like India, China, Brazil, and South Africa.	Civil society Designers Local governments
Global Survey on SL	Insights from over 20 countries around the globe from young adults (18-35) in urban areas on their current lifestyles, aspirations for the future and reactions to sustainable lifestyles.	Policy makers Business Communicators Researchers/experts NGOs
Intercultural Sister Classrooms	Teaching methods combining life-cycle thinking with global citizenship; tested on schools in the USA, Mexico, Costa Rica and Brazil	Educators Students
Literature review on Sustainable Lifestyles	Identified gaps in research which should provide deeper understanding on SL and how it can be achieved. Also made recommendations on further research to realise SL.	Experts NGOs Policy makers
Making the Business Case for SL	A series of seven guidebooks covering business opportunities and new business models that are required for businesses to promote SL.	Business
Toolkit for Advertising and Marketing	Toolkit giving the next generation of marketing, advertising and communications professionals the understanding and tools to incorporate sustainability into their professional careers.	Business Communicators Students Teachers
YouthXchange	Youth engagement projects across 22 countries worldwide. Youthxchange materials have been adapted using local languages, images and examples.	Youth workers Local government NGOs Students Educators

Source: (Adopted from Ministry of the Environment Sweden n.d.)

Beyond individual consumers

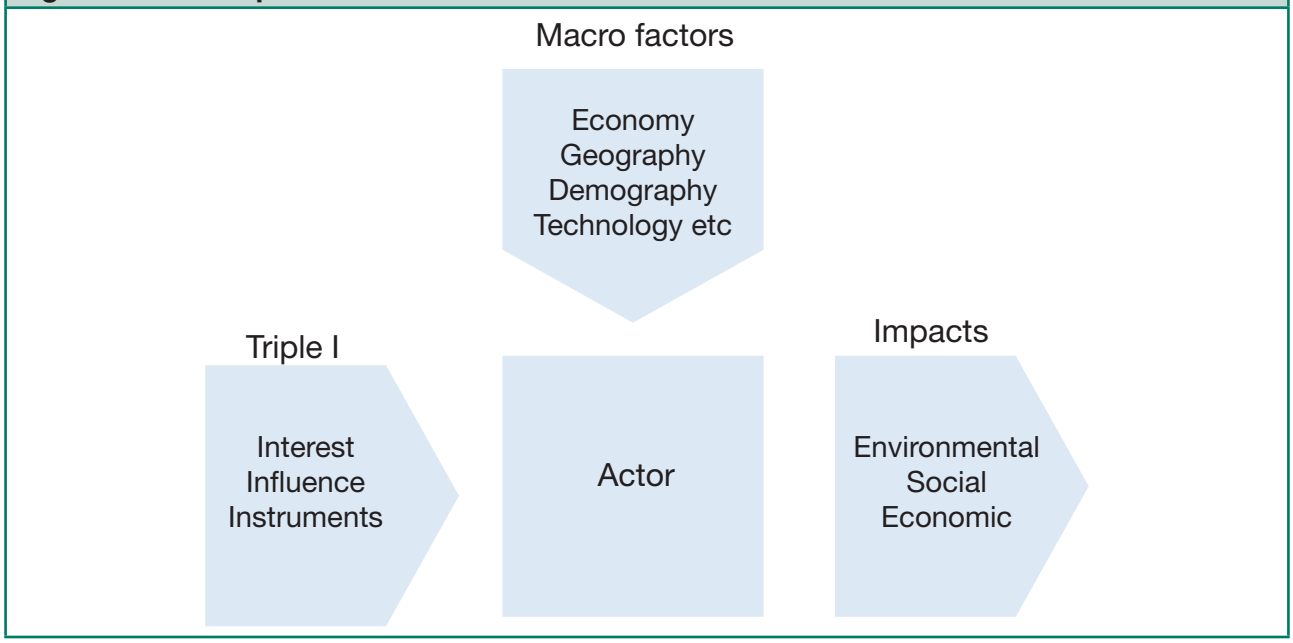
The banning of plastic shopping bags, campaigns for energy efficient light bulbs and recycling of household waste are some of the actions that have typified approaches to sustainable consumption in public awareness campaigns. There is however, evidence that such actions hardly achieve the objective of sustainable consumption. Studies of the so-called *rebound effect* demonstrate that relative sustainability gains in efficiency are often upset by increases in absolute levels of consumption. For example, although washing machines and television sets have become more efficient, savings per unit have meant that people buy even more - therefore absolute amount of consumption has increased, outstripping the efficiency gains.

Sustainable consumption does not necessarily mean shopping for more sustainable alternatives, it sometimes means not shopping at all. Finding alternative ways of meeting needs is also a key component of sustainable consumption. Designing and implementing effective policies is likely to have wider and faster implications towards sustainability, than hard efforts to change individual actions. As the following section demonstrates, the consumer is not always king!

Understanding stakeholder salience: The Triple I model

The Triple I framework is used in describing and understanding factors that shape production and consumption and how much influence stakeholders have on the choices they make. It can be used to determine how much opportunity an individual has in choosing to become a sustainable consumer – consumption that has minimum negative environmental social and economic impacts.

Figure 7:5 The Triple I Model



Source: (Akenji & Bengtsson 2010)

The Triple I's refer to the interaction of interests, influences, and instruments of stakeholders in the production-consumption chain. To identify intervention points for sustainable consumption, the framework analyses stakeholders, including investors, manufacturers, distributors, retailers, waste managers and government, using the Triple I's. This provides an understanding of the drivers of production or consumption by each stakeholder group, what influences their decisions in system, and how power is wielded by them or upon them by other actors. By analysing these elements, it can highlight individual and institutional opportunities and indicate directions to facilitate a general shift towards more sustainable production and consumption.

i **Interests** represent various stakes in production or consumption.

- Who are the key actors involved in the design, manufacture, distribution, retail, use and waste management of products?
- What are their needs / expectations (e.g. housing needs for citizens, well-being of society for governments, profits for producers)?
- What are the drivers, patterns and trends of consumption or production?

ii **Influence** refers to the role of each actor, influence over others and the actor's position and relative importance in the system. This identifies who the most influential actors are.

- What is the role of each actor in the system?
- To what extent can each of these actors influence the design, manufacture, distribution, retail, use and waste management of products?
- How much influence does each actor have in the system?

iii **Instruments** are mechanisms of operation of each actor - what actors use to wield influence, institutional frameworks under which they operate and opportunities for sustainable change.

- What instruments does each actor use to influence other actors in the system (e.g. consumer boycotts, advertisements by producers, procurement guidelines by government)?
- What other institutional aspects are likely to influence the design, manufacture, distribution, retail, use and waste management of products (e.g. consumer organisations, industry awards, government consumer agencies, etc)?

By mapping the above, a picture emerges of who the most powerful stakeholder is. Given that production and consumption take place within a broader societal context, results of the Triple I analysis are further placed within macro factors that affect consumption and production - such as technology, economy, demography and culture.

Results of such analysis often show that in the larger system, consumers have somewhat less influence than is often thought. For example, investors pre-determine what is produced, advertising has a strong influence on consumer decisions and government policies that subsidise unsustainable production make it more expensive for consumers to afford the more sustainable options.

This is also supported by research looking at everyday practices of households (theories of practice), as well as studies of how infrastructure affects household consumption. Everyday household consumptive activities such as bathing, travelling and eating constitute a set of social practices that cut across society (Shove 2006). Demand for household services like energy, water and waste management is structured by the utility companies, manufacturers and regulators involved in specifying technologies and systems, managing loads and modifying resource flows. The extent to which everyday household consumption behaviour can change is not only dependent on consumer attitude but also on highly interdependent socio-technical networks or systems of provision, the systems through which services or resources are produced, delivered, distributed and used. As such, a more effective framing of sustainable consumption policy is to look beyond just individual actions.

Framing sustainable consumption policy

Policies to encourage sustainable consumer behaviour must therefore look beyond just individual choices. They should address the system within which consumption takes place and seek to address the social and physical infrastructure that enables consumption. An analysis of literature on successful examples has determined three key pre-conditions to achieve sustainable consumption and production. These are: the right attitude by all stakeholders in the production-consumption system; a facilitating system and social infrastructure to translate those attitudes into concrete action; and sustainable infrastructure (Akenji 2012). (These three are sometimes referred to as the mindware, software and hardware of sustainable consumption.)

1. The right attitude by stakeholders.

Stakeholders in this case goes beyond just consumers; it refers to all societal actors who have an influence on consumption and production – such as farmers, investors, manufacturers, suppliers, distributors, lawyers, small business owners, government agencies, consumers, waste collectors and recyclers. A target is for each of these stakeholders to have pro-sustainability attitudes and a willingness to engage in potential solutions.

A good point from which policy makers can consider building positive attitudes is by creating awareness – a pre-condition for change action (Ballard 2005). Four key levels of sustainability awareness include:

1. Awareness of the issue or agenda.
2. Awareness of scale, urgency and relevance.
3. Awareness of the complexity.
4. Awareness of the limits of human agency – e.g. limitations of technology.

Interdisciplinary research shows that attitudes are shaped by belief systems, personal values, social norms, knowledge, the physical environment as well as the legal environment. Examples of how to instill these positive attitudes is through formal school curriculum as well as public events, awareness-raising campaigns and training programs for business leaders, community leaders, judges and politicians etc. By creating an environment where sustainability is a common aspiration, it becomes easier for consumers to engage in everyday sustainable lifestyles. Awareness raising is discussed further in Chapter 12.

2. Facilitators and social infrastructure

Research shows that there is a gap between people's attitudes and their actual behaviour. For example, in surveys consumers repeatedly express their preference for healthy, local products but in reality global brands that tend to be less sustainable sell better than their sustainable local alternatives. This could be for several reasons including price or advertising. This is known as the attitude-behaviour gap. Social infrastructure is a critical determinant of consumer behaviour. *Facilitators* are the social infrastructure that help in translating positive attitudes to concrete action. They serve as incentives to encourage a particular pattern of behaviour, or place constraints to discourage unwanted outcomes. Following are key facilitators that policies makers may deploy towards sustainable consumption.

- Legal - such as laws and standards – e.g. prohibiting the sale of bottled water in a town where the quality of tap water is demonstrated to be safe for consumption. This would discourage commoditisation of water and use of scarce resources for bottling.
- Administrative – e.g. a difficult process for acquiring building permits for construction around wetlands, or a government agency that ensures that local farmers' produce has priority points of sale in urbanising areas.
- Cultural – such as promoting traditional architecture that that is less energy intensive and uses healthier materials.
- Market – such as preferential billing rates for households that use renewable energy sources.

Facilitators create an environment where sustainability options can develop. Examples include providing subsidies for production of more sustainable products, rejecting advertising that misleads children into consumerism and creating award systems that recognise beacons of sustainable lifestyles.

3. Sustainable infrastructure

If a consumer is inclined to lead a sustainable lifestyle but there are no sustainable products, the consumer would have little other option but to consume unsustainably. Infrastructure refers to the hardware for sustainable lifestyles. Such infrastructure should remove lock-ins. Providing a dense network of safe bicycle tracks and bicycle parking space in the city and prioritising bus lanes over private car use would make sustainable mobility the easier option. The appropriate infrastructure could also encourage and prioritise local community bonds over individualisation. For example, granting licences for operating farmers' markets in city centres and on strategic transit spots that lie on the way between work and residential zones or providing tax incentives to local shops that host exchange or trading of used goods. Housing development for example should be planned as hubs that integrate social facilities, transportation options and communal utilities, thus requiring little resource intensity in their everyday use.

Supporting sustainable consumption requires commitment from policy makers and is an essential step in the transition towards SCP.

7.2 Choice editing and restrictions on advertising

What is Choice Editing?

Choice editing has been defined as "...*shifting the field of choice for mainstream consumers: cutting out unnecessarily* damaging products and getting real sustainable choices on the shelves" (U.K Sustainable Development Commission 2006).

It is a method of curtailing or even completely banning the availability of a consumer product or service which is considered harmful or undesirable. It is not a new concept; only the terminology is new. Choice editing has been practiced by Governments for ages: examples include severe curbs and restrictions on availability of drugs and narcotic substances, firearms and the like.

There are different forms of choice editing:

- Banning or restricting availability of products or service: a classic case is the "Ban the Bulb" initiative of the Australian Government which called for replacement of all incandescent bulbs by CFLs and LEDs. Incandescent bulbs were not "harmful" per se, but less energy-efficient and the move should reduce GHG emissions by 4 million tonnes. Other similar measures include the phase-out of leaded petrol and the ban on plastic bags, common to many countries in the world.
- Choice editing on the basis of a component of a product: a typical example is the ban or restriction in the use of paints which contain lead (commonly found in driers and pigments).
- Choice editing on the basis of the manufacturing process: mercury cells in the manufacture of Caustic Soda/Chlorine were phased out due to the potential hazards of mercury.
- Politics and ideology may also dictate restriction or denial of choice
- Choice editing can also be imposed on the basis of other factors, such as the supply chain: "blood diamonds", for example.

In fact there is really no limit to the number of reasons for editing consumer choice.

Depending on the nature of choice editing and the implementing body (government or private sector), choice editing can be applied in one go or in stages. For example, the Government could simply ban a product – both its local manufacture and import. Alternatively, it could ensure reduction in production and/or consumption progressively- an example being the phasing out of ozone-depleting substances.

Role in Policy and Other Options:

When is choice editing used ?

Choice editing is not the preferred method of channelling consumer demand with most commentators agreeing that within reason, the consumer must have full freedom of choice. Governments prefer to facilitate the provision of information to the consumer so that he/she can make an informed choice about what to buy. This has spawned a number of initiatives such as Ecolabelling, which provides guidance on the environmental friendliness or otherwise of many consumer products. Ecolabels are discussed further in the following section 7.3, Sustainable products.

Box 7:4 Labels

Private or co-operative initiatives have resulted in such labels as the Forest Stewardship Council or the Marine Stewardship Council labels, which attest to the environmental sustainability of products. Similarly, "social" labels such as Fairtrade attest to the fairness of the supply chain while the Kimberly Process certification relates to "blood diamonds".

While the provision of information and persuasive measures can succeed to some extent, they often end up with information overload for the consumer, who is faced with a multiplicity of labels such as environmental labels, labels on animal welfare, human rights, workers rights, fair trade and so on, resulting in confusion (Lang Tim 2007).

Deciding to Edit Choice: who decides ?

The Government: In a sense, choice editing was a feature of the Soviet-style "command" economies where not

only the product, but also the manufacturing quantity and distribution were decided by the State. Today, the State continues to play a pivotal role especially in matters concerning the impact of products and services on public health and safety. The State has the mandate to enforce choice editing and the mandate may extend down to Municipal levels. The State's influence on consumer choice is sometimes resented by special interest groups, as witnessed by the outcries in certain countries to legalise marijuana or to resist any forms of controls on firearms.

Tools available to the State include a) legislation and b) fiscal measures such as taxation and subsidies. Other policy measures, such as preferential public procurement may serve to bring down prices and stimulate demand for sustainable products, but these cannot be termed 'editing'.

Manufacturers: The manufacturing sector can also exercise choice editing. Increased awareness of Corporate Social and Environmental Responsibility has led to many manufacturers voluntarily dropping unsustainable or potentially harmful products from their portfolios and the "planned obsolescence", which was widely practiced in the 1950s is no longer as widespread a practice as it used to be. The greatest change has been in terms of pay and working conditions of workers of sub-contractors, where the embarrassment of "sweatshop" conditions has forced the principal to rapidly enforce change.

Retailers: Perhaps more than manufacturers, retailers play a major role in deciding consumer choice, especially in the more developed countries where supermarkets are the source of most consumer goods. Many of the world's largest retailers such as Walmart have their own rating system which "penalises" unsustainable products, to the point where a product may not be found on retail shelves at all. More subtle measures could include differential discounting or denying premium shelf space to less sustainable products. The situation is vastly different in developing countries where "Mum and Pop" stores are the predominant retail outlets as their motivating drivers are very different (Maniates, M 2010).

Problem areas with choice editing:

Choice editing is often contentious, sometimes involving issues of morals or ethics. Civil libertarians and special interest groups often query the right of the State to interfere in freedom of choice and this can be carried to extremes. Such resistance could have political repercussions, which is why Governments prefer less prescriptive methods, such as labelling programmes.

Choice editing at the retail level is practicable when implemented by giant retail chains such as Walmart and Home Depot, but impractical for a small retailer to implement on his own. Even with the larger retail chains, a degree of consumer suspicion persists: is a low "rating" by a supermarket chain really a way to squeeze extra margins from the vendor?

The consumer in a globalised world, particularly where Internet access has permeated, finds it simple to bypass choice editing attempts. He/she can purchase from any number of virtual retailers who publicise their products on the internet – witness the number of "pharmacies" selling banned pharmaceutical substances from anonymous manufacturers across borders. When governments use taxation as a measure of choice editing, smuggling proliferates, such as with cigarettes. This not only defeats the purpose but deprives the state of revenue.

Restrictions in Advertising

The proverb *"Build a better mousetrap and the world will beat a path to your door"*, attributed to Ralph Waldo Emerson (1803-1882), has long fallen into disuse. It is now accepted that producing a better product is not enough. It has to be advertised and promoted heavily if it is to succeed in the marketplace.
Advertising fulfils several positive functions:

- It informs the consumer of a product – its attributes, benefits, advantages and availability.
- It provides justification for the consumer to buy a product in preference to another generic equivalent or another alternative product which meets the same needs.
- It can act as a driver for competition and greater innovation.

But advertising is a two-edged sword and can also carry negative connotations: it may create a need when none exists, it may spur un-necessary and conspicuous consumption, it may create undesirable rifts between the socio-economic "haves" and the "have-nots" and it can assist larger manufacturers in driving out smaller ones who may not be able to afford the same level of media expenditure. It is these negative attributes which could call for some form of restriction in advertising.

Truth in advertising:

There is no requirement in principle for the advertiser to be entirely truthful in the advertising and examples of "stretching" the truth, semantic obfuscation and deliberate misinterpretation abound.

Box 7:5 The truth about orange drink

Example: A product, available in powder form, is widely publicised as an "Orange Drink" with the packaging as well as publicity material containing illustrations of the fruit. Inspection of the label reveals not a hint of natural orange; the product is 100% synthetic.

Consumers in developing countries are particularly susceptible to misleading advertisements. In some cases, standards are evolved – usually by an industry body or association – which are far removed from reality, allowing an advertiser to "legitimately" make claims which mislead the consumer. A typical example is the fuel-efficiency figure for automobiles, which are based on unrealistic driving conditions that very few consumers are likely to meet.

In its crudest form, misleading advertising contains un-truths which are difficult, if not impossible, for an individual consumer to disprove. A slightly more advanced form is making tall claims for products but with the advertiser's identity concealed – web-based advertising and spam e-mailing are the usual vehicles. In yet more sophisticated cases, the advertiser claims to have received an award or certification to "world" standards, carefully concealing the fact that the awards can be bought for a small fee. This enables manufacturers to claim that their products are "environment-friendly" or "eco-products".

Box 7:6 The truth about washing machines

Example: Washing machines in India are often advertised as being "environment friendly" based on just one attribute – energy efficiency in terms of watt-hours. Neither the water consumption nor the consumption of detergents is considered.

Misleading advertising can be found for any product or service but as consumers begin to pay greater heed to the environmental and social impact of their purchases, deception and obfuscation have entered the

sustainability arena as well. In India, for example, many products claim to be "environment-friendly" without any back-up or justification provided. A variation is the claim of being "environment friendly" based on just one attribute.

Restrictions on Advertising:

Most countries place some form of restriction on advertising. Certain goods and services are completely prohibited from being advertised (e.g. drugs and narcotics) while in other cases, advertisements must carry a statutory warning (e.g. cigarettes). Cross-country examination reveals that such prohibitory measures are generally taken on grounds of public health, safety and security. Increasingly, countries are also prohibiting advertisements aimed at children.

The advertising industry has long resisted the imposition of any external code of conduct and instead prefers self-regulation and a voluntary code. The International Chamber of Commerce has evolved a code and the resultant self-regulatory system has been adopted in 35 countries. Most recently, the Chinese Responsible Marketing Code was endorsed by the Chinese advertising industry in April 2011. (See the case study in section 7.3 for more information on this.)

Efficiency of self-regulatory methods:

The bodies which examine violations of the self-imposed code of conduct are generally a mix of advertisers, advertising agencies and the media – all of whom can be said to have "vested interests". The body may invite members from Government and/or civil society as well. The code is known to all members, yet published statistics often reveal continued violations of the code - sometimes repeatedly by the same manufacturer or advertising agency, while the media continues to accept advertising in violation of the code. This appears to indicate that the code is not working as designed and the root cause of the problem is that the self-regulatory body is reluctant to take punitive action against offenders.
In summation, if the intention is to channel consumer demand to more sustainable goods and services, neither choice editing nor restrictions on advertising – or even a combination of the two – will be sufficient as a stand-alone action. Accompanying these should be vibrant and well-conceived ecolabelling and consumer information schemes, initiatives to increase public awareness, incentives and disincentives for consumers and manufacturers alike, all integrated into a holistic strategy led by Governments but including all relevant stakeholders.

7.3 Sustainable Products and Product Information

What it are sustainable products and why are they important?

UNEP/ Wuppertal Institute Collaborating Centre on Sustainable Consumption and Production (UNEP 2010) defines a sustainable product as a '*product that incorporates environmental and social factors and minimises its impact throughout the life cycle, throughout the supply chain and with respect to the socio-economic surroundings*'. Another broad definition of a sustainable product identifies it as '*an item or service that minimises its impact on the environment at each phase of its life cycle'* (NSW Government 2011). These definitions consider the triple bottom line of sustainable development and recognise the need for a lifecycle perspective to manage resources and achieve resource efficiency.

Box 7:7 Product characteristics, standards, certification, eco-labels and accreditation

Thousands of products exist in the market today. In one way or another, most of these products have gone through testing against a standard. The International Organization for Standardization describes standard as 'a document established by consensus and approved by a recognized body that provides for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context' (ISO/IEC Guide 2: 1996). Therefore, a standard is 'generally a set of characteristics or qualities that describes features of a product, process, service, interface or material' (WIPO n.d.). In many instances and depending on the economy, product standards are mandatory for a product to enter a market. This standard ensures that the product adheres to quality, safety and other set criteria. A product that meets this standard gets certified or a certification mark from the governing agency or organisation.

The growing concern of consumers regarding the sustainability of the products they consume led to the development of another standard in the form of eco-labels. These are voluntary standards that involve certain criteria for it to be environmentally-preferred. Testing against such criteria makes a product certified by an eco-label such as the EcoMark of Japan and Green Choice of the Philippines. In recent years, global ecolabel entities are working hard to develop multilateral accreditation of national ecolabels to reduce duplicating ecolabelling work of individual economies.

The lifecycle assessment (LCA) framework assesses the aspects and impacts throughout the material extraction and disposal of a product with a specified goal and scope. This assessment method can be applied to improve environmental performance and develop sustainable products. A number of criteria or characteristics may be established in classifying sustainable products. Taking cue from EcoMark, certification criteria can take into consideration the lifecycle of a product and priority areas to incorporate environmental issues in ecolabels. An example of a framework for the development of sustainable products is developed by the Lowell Center for Sustainable Production which considers five aspects as given in Figure 7:6 (Edwards 2009).

Moving towards the development of sustainable products provides opportunities for the reduction of environmental and social impacts. The specific product design can account for as much as 70% of the product costs throughout its lifecycle (Improving Engineering Design cited in Edwards 2009). Further improvements can be achieved by designing products for longevity, usefulness beyond product's first lifecycle and disposability with proper regard for impacts. An example of sustainable product design is the European Union funded project – Cleaner Production for Better Products (2007/2008). This aimed to increase local added value to exports, and address environmental and social impacts of products from selected Asian countries through awareness and capacity building.

Figure 7:6 Lowell Center framework for sustainable products

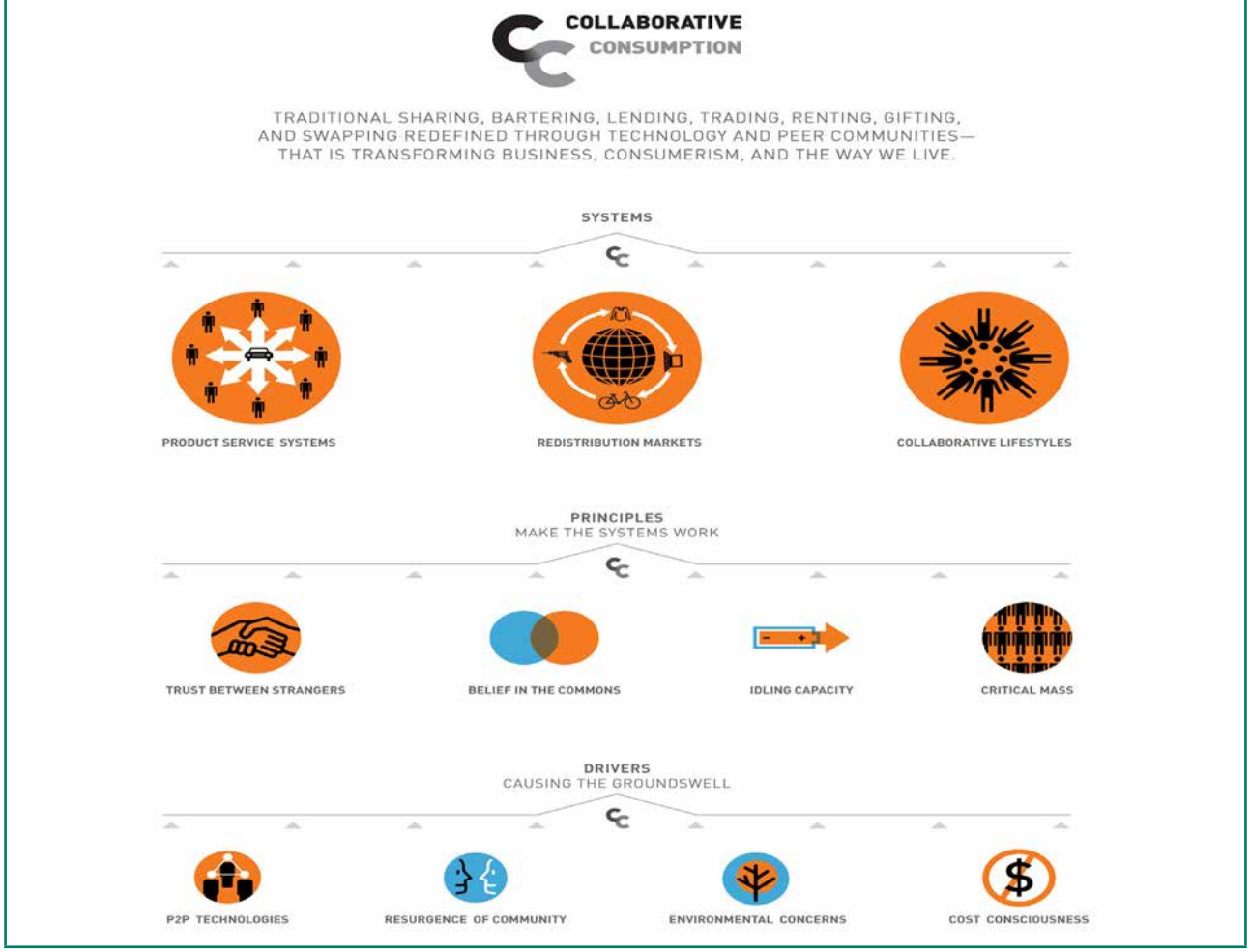
Source: (Edwards 2009)

In relation to sustainable product design, product service system (PSS) is an approach that has the potential to lessen consumption or consumerism. With PSS, markets are created for utilities as opposed to products. The premise behind this shift is that consumers seek the service of a product and not the product itself. Selling products tends to consume more material and energy resources through its production, maintenance and the number of units sold; whereas, utilities provide a service where a few own and maintain a product that will be used to serve clients. Essentially, PSS comprises of a system of products and services that serve a particular network, and has the potential of lessening the impact of a product and service throughout its lifecycle. While this concept is not new (house rentals and taxis are examples), more innovations will be needed to expand the impact of PSS in businesses. In PSS, consumers' choice is driven by both environmental and economic interests.

A concept related to PSS is collaborative consumption which can be likened to old market behaviours of bartering, sharing, lending and swapping, but is done through network technologies. 'Collaborative Consumption is disrupting outdated modes of business and reinventing not just what we consume but how we consume' (Collaborative Consumption Hub n.d.). The acceptance of this behaviour by consumers is driven by a number of factors and governed by a set of principles, detailed in Figure 7:7.

Developing environmental interests among consumers is a challenge in creating a market for eco labels. The method of cascading product information from producers to consumers must be effective for it to be valued by consumers. A method of promoting sustainable consumption is through green public procurement, which can often correspond to a significant percentage of purchases. By showing that the government prioritises green products, consumers may be encouraged to adopt the same attitude. This is explored further in Chapter 9, Sustainable Public Procurement.

Figure 7:7 Drivers, principles and systems of collaborative consumption



Source: (Collaborative Consumption Hub n.d.)

At the end of the lifecycle of a product is the disposal stage. Consideration of a products disposal should bear the same weight as the design and production stages. Improper disposal, perhaps owing to the lack of a collection facility and knowhow of designated waste collectors, also impacts the environment and community. Introducing extended producer responsibility (EPR) or manufacturer take-back schemes moves the responsibility of disposal to the manufacturer, who has the knowledge and capacity to safely and properly reuse or dispose of the product.

Policy options

In light of lifecycle thinking and triple bottom line conditions at the local level, policy opportunities exist in each phase of the product or service and in creating an enabling environment for the promotion of sustainable products, services or PSS. For instance, product design and raw material sourcing need not only cater to market demand, but also to product utility and inherent impacts. Production processes can benefit from establishing sustainability criteria in the materials and process. These criteria can be related to product components or geared towards specifications and set into product and service standards. Markets for sustainable products and services can be promoted through consumer education and relaying of product information.

EPR can initiate adoption of the 3Rs (reduce, reuse, recycle) by manufacturers in the post-consumption stages and allow for innovation from the producers to introduce eco design concepts into their products, with regard for its environmental impacts throughout the lifecycle. Implementation of sustainability in products can bank on existing legal frameworks and systems, such as the Waste Electrical and Electronic Equipment Directive (WEEE) and Restriction of Hazardous Substances Directive (RoHS), as appropriate to facilitate mainstreaming of eco-design requirements. Studies have shown that it is easier to establish and promote sustainable products if there is an existing policy scheme related to the product category. However, when these legislations are not yet available, much work is needed in agreeing to a definition of sustainability, the criteria for sustainable products and the overall vision for such a program. The following points suggest more details on these policy options to promote the use of sustainable product and services.

- **Regulatory policy instruments are essential**, requiring a complete set of rules and guidelines and a pool of experts. For instance regulation of ecolabel and “green” claims, waste management directives, efficiency standards, green public procurement schemes, EPR regulation, statutory pollution emissions targets and water quality targets.
- **Economic policy instruments are essential** to internalise externalities. These instruments are gaining acceptance locally and internationally. For example waste fees, taxes on energy and water use, sewerage taxes in water bill, deposit-refund schemes for beverage bottles and batteries, appropriate timing of removal of resource subsidies, subsidies for green energy and tradable permits for municipal waste.
- **Policy supporting the Plan-Do-Check-Act cycle** should cover the state of environment assessment and goal setting (connected for example, to Five Year Programs or Plans), development of sustainable consumption incentives (for consumers) and recognition (for producers) for environmentally superior technological innovation and diffusion. Indicators connected to the national State of Environment (SoE) should be set early in these programs, to be used as parameters in measuring future success level.
- Green investments should be promoted to provide green industry and greening of industry to deliver sustainable product/ service/ PSS; and there is a need to provide **capacity building** for both public and multi-stakeholders to operationalise policy opportunities.
- Policy opportunity should harvest on the **important findings of the LCA tool**, wherein product stages of high impact would be given priority. LCA outcomes should inform policy of what measures to take, or priority sectors to emphasise. For instance in energy-related products, energy consumption during product use may have significant impacts on energy requirements throughout the lifecycle. A standard procedure in assessing and addressing outcomes of an LCA can provide meaningful measures in this respect.
- Products that have short lifecycle (intro-growth-mature-decline) such as electronic and energy related products usually involve innovative and rapid technological developments, making them good candidates for supportive policy to promote **eco-design**.
- **Communications with the public** is a necessity. Despite the societal concern on end-of-life management, it has not been translated into consumers’ willingness to pay for products with less environmental impacts. Accelerated actions that occurred after the emergence of the EPR legislation in Japan, in contrast to voluntary design guidelines on end-of-life management, indicated the strength of legislation in taking concrete measures that may require substantial initial costs. The contrast between the design guidelines and EPR legislation also demonstrates the role of take-back requirements in effectively linking downstream and upstream activities (Tojo 2004).

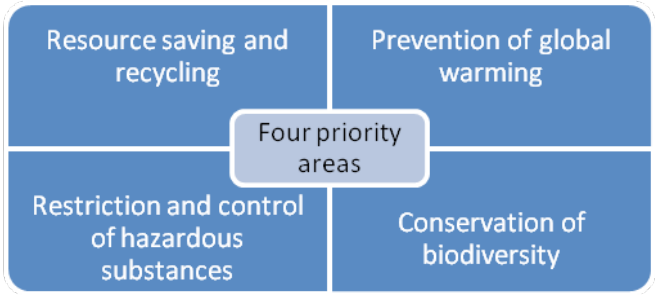
- There is a need to overcome the **absence of multilateral ecolabel recognition**. Less than 30% of ecolabels recognise or are recognised by other labelling organisations, as surveyed among 340 global programs in 2010. For product information, B2C (type 1) and B2B (type 3) ecolabels should seek multilateral recognition through efforts of global networks, such as GEN and IGPN.
- **Multi-stakeholders' participation or public private partnership (PPP)** in modern EPR schemes may vary between countries considering social values, product secrets and economy of scale, among other things. Private enterprises could have conflicting interests with a collective take-back scheme (in which one entity will process the end-of-life stage of a product for all brands/models) in terms of product secrets; whereas, encouraging a company-based (individual) take-back policy may not have the economy of scale to potentially be viable. On the other hand, existing patterns of consumption and consumer attitude towards recycling may be taken into consideration in designing EPR policy as these can have a rebound effect.
- Sustainable product procurement policy can link up with inter-agency product recognition to provide reduced management risk for procuring companies, e.g. toxic material pollution penalty, increased local product purchase.

Case Study: Ecolabel and Green Procurement China and Japan

Since the early 2000s, there have been increased interactive meetings on ecolabel and green procurement amongst Asian counterparts. An event held in Japan in 2005 chaired by Inaba indicated interest in further collaboration in developing a database clearing house. At the same time the, Asia-Pacific LCA database network was launched in Tokyo, while eco-product promotion events blossomed in Beijing.

Japan and China started their ecolabel programs in 1989 and 1993, respectively. Increasingly successful through promotion with the Japan Environment Association, EcoMark has the greatest share of the Japanese ecolabel market at 97%. The Japanese ecolabel and green procurement suppliers are reaping the benefits of the Green Purchasing Law introduced in 2000. It covers designated procurement items in 19 sectors with a range of 261 items; while EcoMark covers 50 product categories with 5,118 products. The criteria for eco marks have been set to exceed the criteria set in the Green Purchasing Law. The four priority areas considered in developing EcoMark certification criteria are provided in Figure 7:8. There has been a consistent update of this effort; from 2011-2012, there were 4 new categories developed in EcoMark, and a further two categories are currently in the pipeline. Many Asian economies have expressed an interest in learning from the Japan promotional efforts on green procurement, as well as the type III ecolabel in Business to Business (B2B) model.

Figure 7:8 Priority areas considered in developing certification criteria by Eco Mark



GPP has continued to become a great success, also in China. In 2005 expert group meetings exploring in-depth GPP were held at the Ministry of Environmental Protection (MEP), Beijing. Realising that procurement by the state-owned enterprises and government alone correspond to a great market share, Chinese officials noted that GPP in China could be an extremely useful tool to pilot the effect of bringing down sustainable product cost (and price) in lieu of economies of scale.

Initially guided by 11 ministries, Environmental Certification Center of MEP (CEC) was authorised by the MEP in 2003 to assume the function of environmental certification of products in China. In accordance with the principles and procedures in the standard setting procedure of ISO 14024, the views of stakeholders were fully adopted to ensure objectivity and impartiality. Diverging from the Japanese counterpart, Chinese certification involves authority from MEP directly (Figure 7:9).

Figure 7:9 Structure of environmental labelling management

Source: (Zhang n.d.)

The Chinese environmental labelling program has been in operation for over 20 years. Its certification standards now cover 85 categories of products and more than 40,000 certified models of products. Company participants increased fivefold from 200 to 1,000 starting in 2002. Building on the ecolabel success, the Ministry of Finance (MOF) has carried out green procurement in China since the 1990s, setting national green procurement policies and a series of regulations. Government Procurement Law was enforced in January 2003. The Chinese government continuously expands its extent of GPP year by year. On October 24th, 2006, the MOF and MEP officially launched China's GPP. From 2006-2011, the amount of GPP has increased fourfold. This is a result of several laws in China, namely:

1. The government procurement Law of People's Republic of China.
2. Cleaner production promotion law of People's Republic of China.
3. Circular economy promotion law of the People's Republic of China
4. Scientific concept of development (October 2003), that is, "people-oriented, comprehensive, coordinated and sustainable development, and promote the overall economic, social and human development", since the State Council introduced a Series conducive to promoting green procurement management
5. The 12th five-year plan on national economic and social development (March 2011). The plan clearly advocates a civic, economic, green and low carbon consumption concept promoting the formation of green lifestyle and consumption pattern consistent with China's national conditions.

Since the implementation of GPP seven years ago, the Chinese government has issued a total of eight lists for Environmental Labelling Products, covering 24 product categories, with more than 550 participating companies and over than 18,000 models of products.

Further Reading

7.1

Motivating Sustainable Consumption: a review of evidence on consumer behaviour and behavioural change, a report to the Sustainable Development Research Network, by Tim Jackson, Centre for Environmental Strategy, University of Surrey. This report, presented to the Sustainable Development Network, UK, reviews the literature on consumer behaviour and behavioural change. It discusses the evidence base for different models of change. It also highlights the dilemmas and opportunities that policy-makers face in addressing unsustainable consumption patterns and encouraging more sustainable lifestyles.

Jackson, T 2004, *Motivating Sustainable Consumption: a review of evidence on consumer behaviour and behavioural change – A report to the Sustainable Development Research Network*, University of Surrey Centre for Environmental Research, UK.

Task Force on Sustainable Lifestyles is the final report of the Marrakech Task Force on Sustainable Lifestyles. It presents lessons from projects around the world aimed at promoting sustainable lifestyles. It also highlights resources that stakeholders will find useful in designing and implementing sustainable consumption projects.

Marrakesh Process Secretariat (United Nations Environment Programme and United Nations Department of Economic and Social Affairs) 2010, *Paving the Way to Sustainable Consumption and Production – Background paper for the Commission on Sustainable Development, Eighteenth Session*, CSD18/2010/BP4.

Consumer Scapegoatism and Limits to Green Consumerism, commissioned as a framing paper for the launch event of the Global Research Forum on Sustainable Consumption and Production, this paper examines some of the easy misconceptions about sustainable consumption. It analyses some of the main challenges of achieving sustainable consumption by focusing only on individual consumer behaviour, and makes recommendations for policy makers to develop more effective ways of mainstreaming sustainable consumption.

Akenji, L 2012, 'Consumer Scapegoatism and Limits to Green Consumerism', *Proceedings of the Global Research Forum on Sustainable Consumption and Production Workshop.* Rio de Janeiro, Available from: < http://grfscp.files.wordpress.com/2012/05/grf-2012-rio-akenji.pdf>. [12 September 2012].

7.2

Editing Out Unsustainable Behaviour provides a comprehensive discussion on choice editing by governments and the private sector.

Maniates, M 2010, *Editing Out Unsustainable Behaviour*, The World Watch Institute, Available from: <http://blogs.worldwatch.org/transformingcultures/wp-content/uploads/2009/11/SOW10-Choiceediting.pdf>. [15 September 2012].

The International Chamber of Commerce's Commission on Marketing and Advertising's website provides more detailed information on choice editing, marketing and advertising.

International Chamber of Commerce's Commission on Marketing and Advertising (ICC) n.d., *ICC Commission on Marketing and Advertising*, Available from: <www.iccwbo.org/advocacy-codes-and-rules/areas-of-work/marketing-and-advertising>. [September 2012].

7.3

Product-service systems and sustainability: Opportunities for sustainable solutions presents opportunities and policy examples that suit the local scenario, illustrating how Product Service Systems (PSS) can influence or contribute to sustainable lifestyle. PSS is a logically efficient sustainable product, and it takes careful design and consideration on culture and adaptation.

Manzini, E & Vezzoli, C 2002, *Product-service systems and sustainability: Opportunities for sustainable solutions*, UNEP & Interdepartmental Research Centre Innovation for the Environmental Sustainability, Available from: <http://www.unep.fr/scp/design/pdf/pss-imp-7.pdf >. [01 August 2012].

Design for Sustainability: A Step-by-Step Approach is a UNEP publication that provides systematic view of the design for triple bottom line.

United Nations Environment Programme & Delft University of Technology 2009, *Design for Sustainability: A Step-by-Step Approach*, UNEP, Paris.

8 Sustainable Cities

8 Sustainable Cities

Key Learning Points

- The relevance of sustainable infrastructure for the Asia-Pacific region.
- Whole system designing to create sustainable infrastructure.
- Metamorphosis from vicious to virtuous cycle of development.
- Policy options to promote sustainable infrastructure.
- Defining urban planning in the context of sustainable cities.
- Urban policy must take into consideration the principles or elements of sustainability.
- Waste management plays an essential role in sustainable consumption and production
- Sustainable waste management approaches exist which can help to achieve the regional aims on environmental protection as well as socio-economic development.

Asian cities and towns will see a doubling of the population, from 1.3 billion in 2000 to 2.6 billion by 2030, an additional 120,000 people per day for the next 20 years (UN 2011). Combined with the increasing rate of urbanisation, cities across the region are facing huge challenges in supporting the energy, infrastructure, water and sanitation needs of their booming populations. However, these challenges also present significant opportunities - to move towards sustainable design in the development and retrofitting of cities. This chapter highlights the role of government in transitioning towards sustainable cities through sustainable infrastructure, sustainable urban planning and sustainable waste management.

8.1 Sustainable infrastructure

Relevance of sustainable infrastructure in Asian cities

Most countries in the Asia-Pacific region are in the process of development and lack the infrastructure needed to meet the needs and aspiration of their people. Moreover, natural disaster-related recovery and rebuilding, which is estimated to cost between 2 and 15 per cent of an exposed country's annual GDP (World Bank 2004), provides opportunity to plan and develop infrastructure that puts less pressure on resources and is better adapted to climate change.

The region is experiencing rapid population growth. The rate of production and consumption will have to grow even faster to keep pace with population growth and a region increasingly divided by inequality. Further, the Asia-Pacific region has been less efficient in its use of materials as witnessed by an approximate 30% increase in material intensity between 1990 and 2005 (Cribb, Schandl & Hosking 2011); technology has so far contributed little to reducing the resource pressure. This is exactly the opposite of what is needed to maintain human development while avoiding adverse impacts on the global environment, declining fresh water and the threat of peaking world oil production.

Infrastructure serves as the backbone of urban development. Lack of infrastructure can have direct and immediate impacts on urban economic growth and prosperity. While Asian cities are struggling to provide adequate housing, mobility, energy, water and sanitation to all, they are faced with unprecedented challenges of excessive waste, congestion and pollution. Just as the progress in medicine has improved human health and lifespan, technological progress has resulted in longer lifespans of infrastructure such as buildings, roads, energy and water generation and distribution systems. The choice of infrastructure determines the consumption and production patterns. For example, buildings and the construction sector consume up to 40% of global energy and account for 30% of global greenhouse gas emissions (UNEP 2007). The transport sector, which is one of the fastest-growing sources of emissions in developing countries, accounts for 23% of global energy-related CO_2 emissions (ADB 2010b).

Rapid urbanisation has led to land price increases and urban sprawl, boosting the traffic, increasing driving distances and reducing the attraction of walking and bicycle transport. Infrastructure takes the shape of highways and flyovers mainly catering to individual modes of transport. Combined with poor service provision this results in more travel, more fuel consumption and more air pollution. Also, as a result of sprawl, modern cities are planned according to the dimensions of cars, with broad highways and flyovers. This creates a vicious circle - it boosts traffic, increases distances people drive and reduces the attraction of walking and bicycle transport. According to Sierra Club (2009) estimates, sprawl development uses five times more pipe and wire, five times more energy for heating and cooling, twice as many building materials, three times more automobiles and causes four times more driving. It also consumes 35 times as much land and requires 15 times as much pavement as compact urban living.

Box 8:1 Why is planning sustainable infrastructure important?

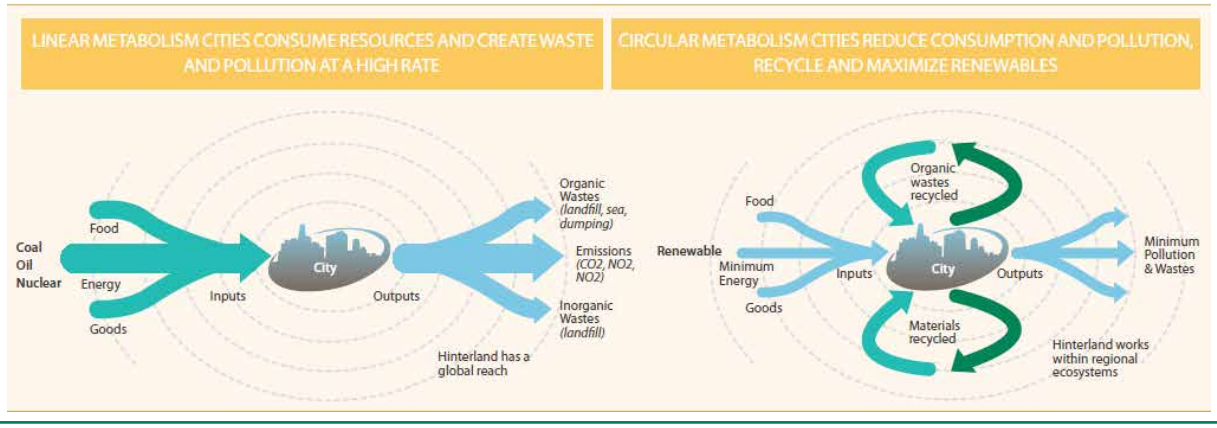
The size and duration of infrastructure development requires that it be evaluated more critically for efficiency and function.

As described by Hawken et al (1999) in **Natural Capitalism**, "By the time the design for most human artefacts is completed but before they have actually been built, about 80-90 percent of their life-cycle economic and ecological costs have already been made inevitable. In a typical building, efficiency expert Joseph Romm explains, 'although up-front building and design costs may represent only a fraction of the building's life-cycle costs, when just 1 percent of a project's up-front costs are spent, up to 70 percent of its life-cycle costs may already be committed. When 7 percent of project costs are spent, up to 85 percent of life-cycle costs have been committed'. That first one percent is critical because, as the design adage has it, 'all the really important mistakes are made on the first day'.

In the face of looming resource crises and growing demand, increasing resource productivity has become an imperative. Considering the rapid economic growth, there is an urgent need for a paradigm shift in our planning and policy, that allows us to opt for whole-system design, resource-efficient infrastructure and leapfrogging technologies. We need to radically innovate in order to provide modern and improved energy services to a greater number of people, while reducing pressure on global resources and the environment.

Asia will invest around US$10 trillion in infrastructure over the next 10 years (UN-HABITAT 2010). Multilateral Development Banks are increasingly aware that making the right investments now can lock in more environmentally sound, low-carbon and climate-resilient infrastructure that will be around for many decades to come. They committed over USD 9.5 billion in 2011 for better land-use planning, clean energy supply, energy efficient buildings, public and non-motorised transport, improved water supply, waste management and sanitation, and measures to enhance climate resilience. Discerning urban decision makers will need to display strong leadership and commitment towards planning, designing and managing sustainable infrastructure. They must aim for infrastructure that does not burden cities with high debts and does not lock cities into high consumption and production patterns throughout its lifespan. In designing new infrastructure and retrofitting existing ones, decision makers must adopt a leap-frogging strategy, and think 30 to 50 years ahead. Such critical decisions may appear unattractive in immediate terms but will reap long-term benefits.

Figure 8:1 The benefit of a circular metabolism city



As depicted in the above figure, a key component of the sustainable city is a 'circular metabolism' which assures the most efficient possible use of resources (Girardet 2010). Drastic changes have to be made in the urban metabolism in order to reduce the pressure on natural resources such as raw materials, land, water and energy, minimise the impact on the environment and provide better value to the society in the form of higher economic benefits, employment opportunities, delivery of goods and services, and improved quality of life. Examples of such initiatives include:

- Integrated urban land use and transport planning that favours compact cities and public transport instead of urban sprawl and private car-centred development.
- Shifting from road to rail transport.
- Moving away from energy-wasting buildings to low- or zero-energy buildings.
- Converting fossil-fuel dependent and wasteful energy systems into energy-efficient systems that run on renewable energy sources.
- Adopting integrated and decentralised water supply and wastewater disposal systems.
- Turning waste into wealth (e.g. composting or organic waste or recycling of metals).

Box 8:2 Sustainable infrastructure: metamorphosis from a vicious to a virtuous urban water cycle

Roads in Asian cities are dug up every now and then because of the need to cope with the increasing demand for water, energy and telecommunication. Laying new water pipelines needs huge capital investment. It also requires a considerable amount of energy to treat and pump the water over increasing distances. Once the water supply pipelines are laid, the wastewater disposal network has to be revamped because of the inadequate capacity of the existing pipelines to evacuate wastewater. This requires replacement of the existing pumps and an increase in the energy demand for pumping. Finally, the wastewater treatment facility has to be upgraded to handle the increase in wastewater flow. Many state-owned water utilities are unable to recover the capital investment and the operating expenses from the revenue generated from water sold, due to irrational tariffs and leakage in the water network. ADB (2010) reported the rate of water loss through leakages across Asian cities to be an average of 30%.

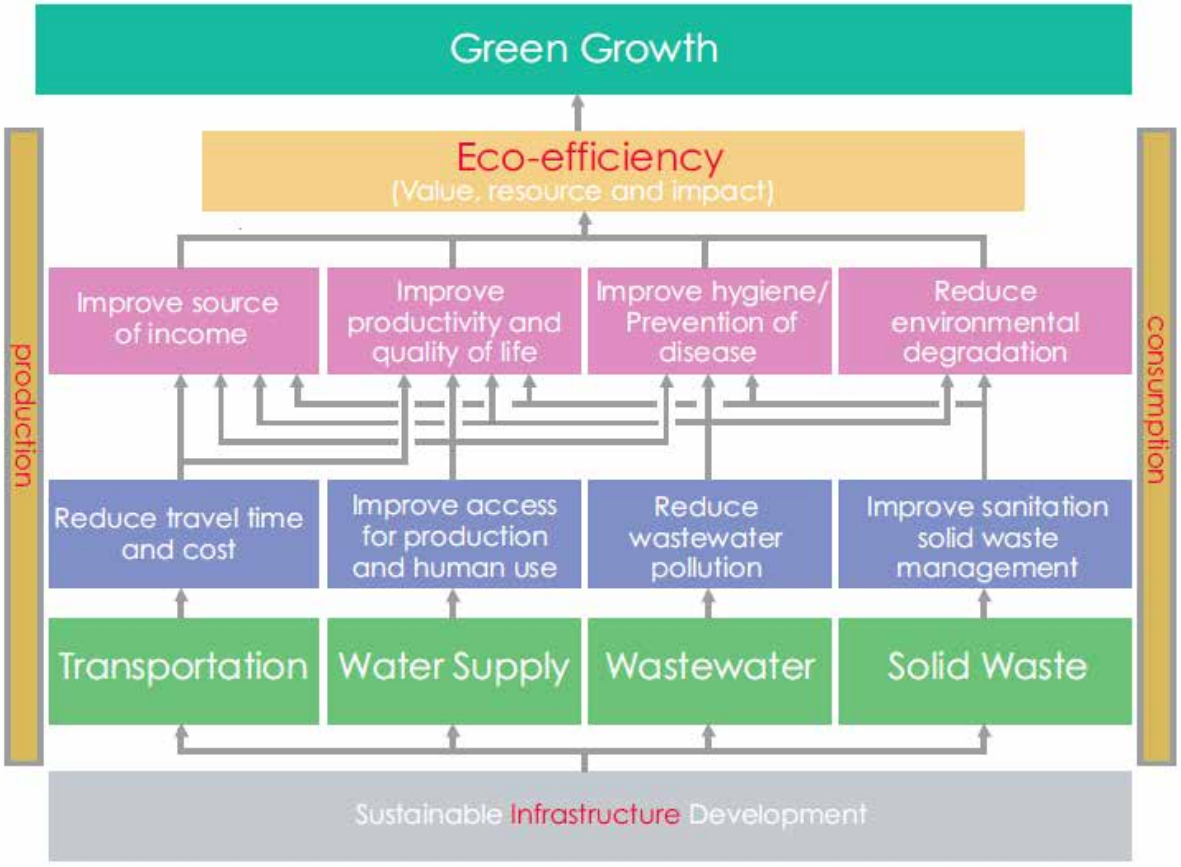
An alternative to this vicious urban water cycle would be to adopt an integrated water cycle management approach that encourages water users to adopt simple and cost-effective water saving solutions through a ***combination of regulatory and market-based instruments***. For example, a steeply progressive water tariff for those who consume more water. Those willing to adopt water saving technologies such as low-water faucets and showerheads, and low-water flushing toilets could be incentivised ***through innovative financing mechanisms*** that ensure that the life-cycle cost of water saved is lower than the cost of water purchased from the water utility. Building codes could be revised to ***mandate the adoption of dual-pipe systems in large buildings*** so that grey water from wash basins and showers could be treated and reused for flushing toilets, gardening and general washing purposes that do not need the use of potable water. ***Rainwater harvesting and storm water management*** could be enforced to further reduce the dependence on municipal water supply.

Finally, decentralised/distributed wastewater treatment facilities could be commissioned as wetland treatment systems at the urban district level, to minimise the pumping energy and encourage reuse of treated wastewater for urban greening and agriculture. Such a virtuous urban water cycle can thus be managed cost-effectively with an integrated urban water management system, achieving potable water conservation, wastewater minimisation and storm water management, while ensuring other benefits such as urban greening and improving urban quality of life. South Australia, for example, is a world leader in some aspects of sustainable water use, including aquifer recharge and the recycling of stormwater through wetlands for commercial purposes.

This analogy of an approach to water sensitive urban design can also be applied to other urban services involving raw materials, energy and waste for the development of economically viable, socially inclusive and environmentally benign urban infrastructure.

The following figure shows how sustainable infrastructure for transportation, water supply, wastewater and solid waste can contribute to eco-efficiency and green growth (UNESCAP 2007).

Figure 8:2 Sustainable infrastructure for eco-efficiency and green growth



Policy Options to Promote Sustainable Infrastructure

Sustainable infrastructure is an attractive proposition in the long-term but there are several hurdles for its propagation. UNESCAP (2012) has identified the following obstacles to sustainable infrastructure:

1. **Gap between collective benefits and individual preferences**: As there is a gap between individual and social costs and benefits, individuals may not favour and support sustainable infrastructure. A typical example is the individual preference for the comfort of a private car versus taking public transport, an option which is far more energy efficient and environment friendly.
2. **Gap between builders and users**: The operation and maintenance (O&M) costs represent the lion's share in the lifecycle cost of infrastructure. It is possible to lower the O&M cost drastically by adopting a whole-system design approach at a marginally higher cost. A developer who is expected to propose competitive prices in order to win the bid for project implementation may not be able to justify an incremental investment though the user can accrue higher benefits through lower O&M costs. Governments can lead the way by adopting life cycle cost analysis in all public tendering process.
3. **Time and price gaps in choosing sustainable infrastructure options**: Sustainable infrastructure guarantees long-term benefits and makes sense on a life-cycle basis. But the benefits may not be adequate to justify higher upfront costs, particularly when the social and ecological costs are not internalised in the market price of the resources needed to operate the infrastructure.

Such barriers can only be overcome if there is political will and leadership for making decisions that may not be popular in the short-term, but will ensure long-term benefits. A long-term vision with well-formulated policies and action plans can motivate active participation of all stakeholders and minimise public resistance. For example, allocating the limited road space for development of a bus rapid transit (BRT) project, may draw the ire of those who are motorised. These stakeholders must be convinced that the proposed service will meet their needs (e.g. due consideration of the last-mile link to public transportation by the provision of alternatives such as bicycle sharing system) and provide additional benefits that will be equitably shared.

Private investment can be leveraged through public-private partnership. However, since most businesses are driven by short-term profits, it is important that the government creates a level-playing field by internalising external costs to render sustainable infrastructure financially as attractive as the business-as-usual practices.

For solutions that project low commercial returns, core public funding may be mobilised wisely in partnership with the private sector. In cases where sustainable infrastructure primarily benefits the population at the bottom of the pyramid but gives very low returns on investment, government may finance the entire scheme and recoup the shortfall by other innovative means. For example, government land may be given to private developers for construction of buildings that incorporate sustainable practices on condition that a certain percentage of the houses are reserved for low-income groups.

Selected policy options to promote sustainable infrastructure development are summarised below:

Table 8:1 Avoid urban sprawl and car-centred development

Policy Option	Policy measures
Make cities compact	Promote infill and brownfill development Institute density standards and mixed-use zoning Promote vertical as well as cluster development
Integrate land use and transport planning	Develop integrated transport and land master plans Promote density along a mass transit corridor
Upgrade slums	Facilitate land sharing Support incremental infrastructure development Provide community mortgages
Promote walkability	Promote car-free development Promote pedestrian-friendly streets
Manage parking	Limit parking space in city centres to discourage use of private cars Integrate parking with mixed use and with mass transit
Preserve open and green space	Mandate green zoning and urban agriculture Mandate green roofs Turn natural capital into social amenity (parks and lakes, etc.)

Source: (Adapted from UNESCAP 2012)

Table 8:2 Move people from private cars to public transport

Policy Option	Policy measures
Fiscal instrument	Remove subsidies for cars Tax vehicle purchase and ownership Eliminate fuel subsidies and tax fuels for vehicles
Regulatory instrument	Restrict/auction license plates for cars
Economic instrument	Implement congestion charges or road pricing

Table 8:3 Reduce the energy consumption of buildings

Policy Option	Policy measures
Economic and fiscal instrument	Eliminate energy subsidies and introduce progressive electricity tariffs Grants, subsidies and tax incentives Preferential loan, interest rate buy-down, revolving fund and green mortgage Feed-in tariff for roof-top solar installations
Regulatory instrument	Building codes and standards Energy labelling and certification Minimum energy performance standard Green procurement
Information and market transformation instrument	Public information and awareness campaign Voluntary labelling and certification Energy auditing Support for technology promotion

Source: (Adapted from Mohanty 2012)

Table 8:4 Manage urban water cycle in an integrated manner

Policy Option	Policy measures
Mandatory instrument (behavioural)	Water restrictions Permanent water saving rules
Regulatory instrument (planning and building)	Water sensitive urban design for new developments Mandatory labelling of water consuming appliances Mandatory water-saving fittings for new homes Mandatory upgrading water efficiency on sale Mandatory rainwater harvesting
Economic and fiscal instrument	Progressive water pricing Rebate on water saving devices Retrofitting existing buildings Rebate on rain water harvesting and water recycling schemes
Information and market transformation instrument	Sensitisation campaigns Demonstration projects Public leadership programme

Source: (Adapted from Corr et al 2009)

Experience across the region

Countries in the Asia-Pacific region are quite aware of the importance of sustainable infrastructure in transforming and sustaining economic and equitable growth in the face of resource crunches and climate crisis. Many countries have already formulated policies and strategies, though not necessarily in a comprehensive manner, to move gradually toward the ultimate goal. The following box presents samples of the types of action already taken by countries in the region (UNESCAP 2012).

Box 8:3 Examples of actions taken in the Asia-Pacific region to develop sustainable infrastructure

- ***Australia –*** *Water sensitive urban design; distributed wastewater system and water reuse scheme*
- ***China –*** *Low carbon city initiative; Bus Rapid Transit (BRT) system in Guangzhou; feed-in tariff for renewable electricity*
- ***India –*** *National Solar Mission with the goal of generating 20 GW of solar electricity by 2022; Perform, Achieve and Trade scheme to lower the energy use of energy-intensive enterprises*
- ***Indonesia –*** *Fossil fuel subsidy reform to eliminate fossil fuel subsidies, combined with a direct cash transfer programme to avoid potential negative impact of the reform on the poor*
- ***Japan –*** *Introduction of high-speed rail displacing road transport and saving energy imports; eco-point system to encourage the construction and renovation of eco-friendly houses*
- ***Republic of Korea –*** *Smart grid roadmap and a large-scale demonstration project in Jeju island; mandating source-segregation of waste at the household level and volume based waste charging scheme*
- ***Malaysia -*** *Solar photovoltaic-diesel hybrid power generation system in Sabah*
- ***Philippines –*** *Integrated storm water management system*
- ***Singapore –*** *Control of the ownership and use of private cars since the 1970s; fiscal measure in the form of congestion charge; water pricing policy allowing for full-cost recovery while upholding equity by providing cash to lower-income households*
- ***Sri Lanka –*** *Community-based decentralised solid waste management and Integrated resource recovery centres in Matale; sewerage service charges based on monthly water consumption level*
- ***Thailand –*** *Tax incentives to attract global car makers to invest in the production of "eco-cars"*

The above examples prove beyond doubt that when there is a political will to move towards long-term solutions, there is most certainly a way to achieve it. For example, Phnom Penh Water Supply Authority's incredible progress within such a short time frame is perhaps unrivalled by any utility anywhere in the world. The details in the following box show that sustainable infrastructure for a clean, drinkable water supply is achievable with political will, dynamic leadership, and autonomy in the policies and day-to-day management of utilities.

Box 8:4 Minimising unaccounted-for water losses: Phnom Penh leads the way

The experience of the Phnom Penh Water Supply Authority (PPWSA) has been a valuable example for other urban centres of the developing world. From a near-bankrupt and totally demoralised institution, it has transformed itself to a viable, vibrant institution that can be compared to most of the world's best-performing water utilities. Within just a decade (1993–2003), it developed a new mindset, modus operandi and team spirit. It has continuously expanded its network, improved its management and operating efficiency, become financially self-sufficient, and progressively increased its net annual profit. Phnom Penh moved from 12.6% metered connections in 1993 to 100% metered connections in 2001.

In the case of Phnom Penh, many measures regarding non-revenue water (NRW) were taken almost simultaneously, requiring a strict system approach. Through strong commitment and a comprehensive program, PPWSA was able to reduce unaccounted-for water (UFW) by 91% in only 15 years, a level of improvement that no developed or developing country has managed to achieve in recent history.

Some of the measures taken by PPWSA were simple but unique. For example, if a meter reader of an area did not, or could not, find an illegal connection, but a colleague did, the colleague received a reward, and the meter reader was penalised. The public was also made aware of the problem of illegal connections. Those customers found to have illegal connections were heavily penalised, and anyone who reported an illegal connection was rewarded. Inspection teams were set up to search for and eliminate illegal connections. (ADB 2010a)

However, time is running out and the Asia-Pacific region cannot afford the luxury of using three times the resources as the rest of the world to create one unit of GDP. Drastic and ambitious transformations in the approach towards infrastructure are required, in order to achieve several-factor resource efficiency and sustain the momentum of economy growth needed to keep pace with the rising population and their aspiration for improved quality of life.

8.2 Urban planning

What is Sustainable Urban Planning and why is it important

The increasing urbanisation and environmental degradation observed in Asia and the Pacific highlight the urgency in bringing together sustainable development and urban planning. Box 8:5 provides information on urbanisation across the region.

Box 8:5 Statistics summarising the characteristics of the Asia and the Pacific

1. Population of 4.2 billion in 2010, equivalent to 62% of world population
2. Second least urbanised region of the world (43% urban)
3. Second highest urbanisation rate at an average of 2.0% per annum from 2005-2010
4. Twelve out of the 21 megacities of the world in 2010
5. Growth in annual average per capita electricity consumption of 4.0% from 2000-2008 against a world average of 2.0%
6. Highest annual water withdrawal due to population, geography and irrigation
7. From 38% in 1990, carbon dioxide emissions accounted for almost half of the world's emissions in 2008
8. Over one-fourth of the world's total emissions from transport, with more than 80% coming from road transportation
9. Concentration of particulate matter (PM10) is higher than the world average and the standard prescribed by the World Health Organisation (UNESCAP 2011)

Urban planning in light of sustainability should address how cities can be built and run sustainably so that they can achieve successful socioeconomic development, while producing limited waste and pollution through the efficient use of inputs such as energy and raw materials. UNESCAP (2008) highlights the importance of urban planning for sustainability of cities by pointing out that "the planning and design of the built environment locks in consumption and production patterns and lifestyles for decades. If a building is designed without sufficient attention to water and energy efficiency, the result is decades of wasted energy and water. Scale this problem up to the city level and add urban planning challenges and insufficient investment in public transport, and the result is a vast waste of time, energy and water, traffic jams, a lower quality of life, and a city that is no longer attractive for people or business."

Strategic Urban Planning Framework

Strategic urban planning is recognised as an important tool that helps local governments conduct themselves more efficiently and effectively in the designing of policy and in its implementation. According to ECLAC, UN-HABITAT & UNESCAP (2011) urban planners and policy makers need to keep in mind four essential questions that will assist them in addressing urban challenges and creating an effective and inclusive, long-term development plan:

- Where are we now?
- Where do we want to go?
- How do we get there?
- Are we getting there?

Figure 8.3 illustrates how answering these four questions involves 10 more detailed steps of the strategic urban planning process.

Figure 8:3 Four stages and ten steps of a strategic urban planning process

Source: (ECLAC, UN-HABITAT & UNESCAP 2011)

A recent report by the UN Habitat (2009) enumerates the requirements of environmentally sustainable urbanisation, as follows:

- Greenhouse gas emissions are reduced and serious climate change mitigation and adaptation actions are implemented.
- Urban sprawl is minimised and more compact towns and cities served by public transport are developed.
- Non-renewable resources are sensibly used and conserved.
- Renewable resources are not depleted.
- The energy used and the waste produced per unit of output or consumption is reduced.
- The waste produced is recycled or disposed of in ways that do not damage the wider environment.
- The ecological footprint of towns and cities is reduced.

Strategic Resource Management

Managing the limited resources especially in the context of urban spaces remains critical. Agudelo-Vera, Mels, Keesman, & Rijnaarts (2011) argue that the current urban unsustainability is rooted in massive resource consumption and waste production beyond natural supply and recycling limits. Hence, to guarantee urban sustainability, cities must be planned to foster strategic resource management. Urban planners need to understand cities and regions as systems that are part of regional and global networks; urban symbiosis as a tool fits in the resource optimisation goal of such systems.

According to Chiu (2004), two major components are essential in the making of optimal resource management in a system:

- **Hardware (Primary) Component:** resource flow accounting, resource use (economic and ecological notions) optimisation and information flow (inclusive of biodiversity/ healthy ecosystem/ raw, waste and recycled energy; water; material flow).
- **Software (Supportive) Component:** political will and commitment, multi-stakeholder (social and cultural) participation and learning and strategic system management.

While there are guiding principles and numerous sample cases of urban planning, evidence suggests that arriving at good practice is very much an "art" rather than a "science", which involves significant trial and error, implying the need for commitment and constant effort of learning (Bai, Roberts & Chen 2010).

Urban Planning Management System with Monitoring Indicators

Good urban planning alone does not complete the work of sustainability achievement. A Plan-Do-Check-Act (PDCA) cycle would be necessary to provide guidance in criteria setting, decision making, priority finding and corrective measurement. Sustainability indicators (inclusive of strategic environmental assessment) which usually comprise economic, ecological and social, as well as governance and technological aspects, are basic rules to monitor progress in urban planning.

In recent years, sustainability indicators to measure performance against set criteria have started being introduced. Various sets of indicators promoted by international and regional organisations, such as the United Nations,UN Habitat, the World Bank, the European Commission on Energy Environment and Sustainable Development, etc. have been used as references for many countries and communities to develop their own sustainable urbanisation indicators systems. Shen, Ochoa, Shah & Zhang (2011) proposed the International Urban Sustainability Indicators List (IUSIL), with the goal of understanding the drivers and goals of urban practices. IUSIL has a total of 115 indicators grouped under 37 categories and structured within four sustainable development dimensions: environmental, economic, social and governance. Advanced indicators were also developed by China in labelling eco-industrial cities or eco-towns as part of the circular economy concept. While land use is not included in the list of their indicators, more intensive investigation on other resource use such as energy and water is provided.

Planning for dynamic and resilient cities

Although urban planning can adopt an efficient resource management strategy to attain its sustainability goals, today's cities are facing greater uncertainty. For instance, climate change leads to various natural disasters, which in return affects human safety and health in many ways. This changing scenario highlights the importance of developing dynamic, resilient cities, which are designed to withstand natural disasters and the impacts of climate change. Ahern (2011) noted that resilience remains largely unpractised in contemporary urban planning and design. He offers a suite of strategies intended to build urban resilience capacity which includes multi-functionality, redundancy and modularisation, (bio and social) diversity, multi-scale networks and connectivity, and adaptive planning and design.

Policy options

How is the involvement of national government and interactions between national and local government in urban development going to create a positive impact for a country? In some instances, the development of cities is mostly under the direct power of the local government, whereas the management of environment and pollution may be the responsibility of another entity. Urban sprawl leads to an increase in demand for inputs of food, fodder and fuel; while on the other hand, by-products of socioeconomic activities create environmental burden from emissions and waste. Allowing for a national urban development policy could, in effect, establish a vision for the development of cities and the country that will guide the cities in shaping their growth according to a structure or criteria set out by the national government. *Interactive vertical integration of urban policies* has the potential of addressing the shared/ related function of different units. Particularly important in this option is the idea that local actions on urban sustainability can contribute to national sustainable development. In this scenario, Local Agenda 21 or greenhouse gas (GHG) emission targets are set in accordance with national medium-term goals (e.g. case of China). On the other hand, introducing public participation at the local government or municipal unit can be a good mechanism in surfacing micro issues that have wider scale impacts which can be collectively addressed through synergy. Success pilot cases at the local level can be scaled up for national implementation. Several policy opportunities exist for urban planning, as follows:

- The strong links globalisation forces have within cities in the Asia-Pacific imply the crucial role of local aspects in urbanisation. The creation of sustainable energy and climate action plans at the local level are recent trends that show increasing local commitment to proposing a framework of local sustainability indicators which will be used both as an assessment and as an action-planning tool development (Neves & Leal 2010). An ICLEI survey in 2010 showed that almost 3,000 local authorities have stated their GHG emissions reduction targets. About half of the municipalities have developed a local action plan; 65% have declared that they have implemented policies and measures, while only 32% have said that they perform monitoring. **There is a need for capacity building at local level to be provided by the national agencies in most developing countries in Asia-Pacific.**

- Movement of goods is increasingly gaining recognition in sustainability of cities. Transformation, storage, transportation, and distribution of commodities increase the energy demand. **There is a need to plan a lean functionality of the city to ensure smooth flow of throughput and low energy demand for metabolism.** Material and resource flow accounting (M/RFA) at city-level would be a good prerequisite.

- Reformed criteria to include new issues (e.g. climate change, environment considerations, etc.) for land use planning would be needed in order to address the issues in urban development. Developing countries such as China, Thailand, Philippines and Indonesia have experienced various degrees of economic growth during the last three decades through urbanisation. At the same time, many ecological and social issues have been marginalised, leading to problems in public safety, health, and social equity. Stormwater in Beijing and Manila, for example, is a significant safety threat to urban inhabitants, highlighted by the flooding during the recent July-August 2012 rainy seasons across the South China Sea strait. **Tools and other resources in land use planning need to be explored to develop urban design policies that assist in the promotion of a resilient, green city.**

- Some researches (Bai, Roberts & Chen 2010) **recognise the importance of policy changes and cumulative effects, the importance of local government, community and international agencies as main actors, and the prominent role of political and institutional barriers.** This finding suggests that the lack of technology does not seem to be a major barrier in urban sustainability in Asia, but rather access to financing and policy appear to slow progress.

- There is a need to take a step further in urban sustainability by considering low or zero carbon development. **Spatial planning and management** can be incorporated in urban design early on as presently urban management is often burdened by management of both urban and rural developments. Demands for efficient and effective management or resulting activities in the countryside should be looked into through spatial planning systems. This is especially true in suburban China grey zone (Meijer, et al. 2011).

- Communication and harmonisation with neighbouring interest groups and future (commercial) owners and users ensures proper, energy efficient, use of the new or redeveloped environments. **Education for and communication** with the general public and the media would be important to deliver a transparent urban planning image.

- Setting comparative benchmarks using indicators for urban planning of similar population or geographical size can be risky. Cities may belong to different stages of economic development, and align with the respective national development plans and priorities of their respective countries. Therefore, the developmental stage of the city can be a new dimension to be considered as a standard benchmark for cities of certain sizes does not exist. Flexible manipulation of indicators is helpful or weight can be assigned to various indicators as an **innovative approach in using indicators for urban planning.** For example, "more" developing economies may gradually shift air quality monitoring from PM_{10} to $PM_{2.5}$ (Gozun 2006).

- **Policy for the poor** may be explored in terms of sustainable settlements. It is widely acknowledged that informal urban settlements are a significant source of pollution. National and local governments hold the responsibility in providing housing for them as they are important stakeholders in the achievement of socioeconomic development (World Bank 1997 in Zhu 2012). Zhu (2012) also emphasises the role of the state in achieving sustainable urban forms.

Experiences from the region: Development of an Eco-town in Penang, Malaysia

Penang is the second smallest state of Malaysia with roughly 1,000 km^2 land area. This coastal state is composed of two parts, namely, the island of Penang and Seberang Perai on the mainland. The manufacturing sector contributes to half of its economy as industrialisation was pursued early on in the 70s. Tourism also drives the economy of the state, whereas only less than five percent is from agriculture. The population is at 1.6 million as of 2010 with 80% urbanisation rate. "Rapid urbanisation and industrialisation in this land-stressed state led to loss of natural and agricultural areas, traffic jams, hill collapse, flash floods, disruptions in power and water supplies, as well as worsening air, riverine and coastal water pollution" (Nasution 2001).

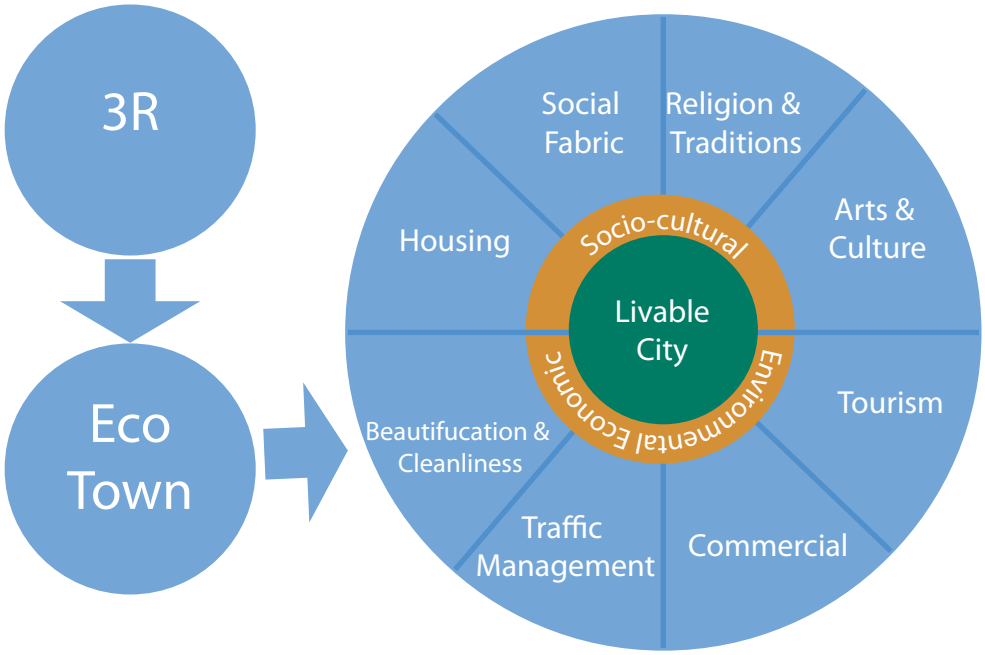
As early as 1982, Penang state had forged a relationship with Yokohama government at the Regional Congress of Local Authorities for Development and Human Settlements in Asia and the Pacific in Yokohama. Inspired by the urban design in Yokohama, Penang's municipal secretary sent an official request for cooperation with Yokohama in 1985. A year later, an MOU was signed between the two governments for cooperation in three phases, namely, urban planning and design (1986-1989); road maintenance and management (1990-1992); and solid waste management (1993-1995).

Sometime in 1997, UN agencies started involvement with development in Penang through the Sustainable Penang Initiative (SPI). Steering away from what used to be a top down approach of development planning, UNESCAP supported SPI in terms of public participation. The UNCSD indicator framework for sustainable cities was also adopted.

In recent years, UNEP has chosen Penang as one of the pilot demonstration sites for an eco-town after conducting a Needs Assessment Survey in 2005. UNEP, together with the Municipal Council of Penang (MPPP), embarked in developing an eco-town in Penang. Essentially, development of an eco-town comprises the introduction of green activities and the sustainable transformation of existing activities (greening the activities). Policies, strategies and action plans were developed and then the project was turned over to the Socio-economic and Environmental Research Institute (SERI) of Penang in 2009.

In the case of the Seberang Perai, the concept of 3R is utilised to promote an eco-town which is seen to result in a liveable city with components as enumerated in Figure 8:4.

Figure 8:4 Eco-town concept in Seberang Perai



Source: (Poh 2012)

The following programmes were implemented in Seberang Perai (Sharif 2011): (a) 3R + incentives programme, (b) composting, (c) mudball, (d) no plastic bag, (e) Green Award, (f) Green School, (g) Local Action 21, and (h) Community engagement in Recycling Programme. Data on the practice of 3R, composting and mudball in 2011 show a very positive increasing trend. The Seberang Perai Municipal Council website (MPSP 2012) lists cleaning and greening, creating an eco-community, and planning and development as part of its Focus MPSP 2012 projects.

Other eco-town initiatives in Penang include the Batu Kawan wherein MPSP (Municipal council of Seberang Perai) was tasked to lead; and Cyber City of Bayan Baru where green productivity and sustainable production are being introduced to transform the city into an eco-town. Penang is a good example of where a focus on sustainable urban planning has led to the development of a more sustainable, resilient city.

8.3 Sustainable Waste Management

What it is and why it is important

The primary objective of sustainable waste management is human health protection. Its secondary objectives are environmental quality and socio-economic development. To achieve these, solid waste management strategies must go beyond purely technical considerations to incorporate political, institutional, social, financial, economic, and environmental realities. Sustainable waste management policy is essential to the achievement of sustainable consumption and production (SCP) and thus should be introduced as an indicator of SCP.

Waste is a by-product of consumption and production. It can exist in solid, liquid and gaseous forms. Without intervention, wastes increase as production and consumption increases. The quantity of waste tends to increase with economic growth. Table 8:5 presents data on waste quantity and composition from a number of developing Asian countries in 2010. While the accuracy of this data may vary from one country to the next, it can be observed that in general waste generation per capita is higher in higher income countries than in lower income countries. The data also shows that food is the major composition of waste in developing Asian countries.

Table 8:5 Waste generation and composition in developing Asian countries

Country	Solid waste generation (million ton/yr)	Waste generation per capita (kg/day)	Waste composition (%)					
			Food	Paper	Plastic	Metal	Glass	Others
Bangladesh	6	0.50	70	4	5	0.1	0.3	20.6
Cambodia	0.5	0.34	66	3	14	1	1	15
China	120	1.15	50	15	10	3	3	19
India	42	0.40	40	5	4	1	2	48
Indonesia	23	0.76	74	10	8	2	2	4
Lao People's Democratic Republic	1.2	0.75	60	15			15	10
Malaysia	9	0.90	49	17	10	2	4	18
Philippines	11	0.50	33	19	17	5	3	23
Thailand	15	1.10	64	8	17	2	3	6
Viet Nam	13	0.40	49	2	16	6	7	20

Source: (Sang-Arun et al. 2011)

Throughout the region, waste volumes are continuously increasing while local governments have insufficient human and financial resources to handle the waste in their jurisdiction in an environmentally and economically sound manner. They are often unable to collect all the waste in their area and their most common approach to waste treatment is open dumping. Solid waste is sometimes burnt to reduce the volume of waste. Illegal dumping is also common. These practices have not only impacted human health and environmental quality, they have also had negative economic impacts, such as discouraging tourism, a major income earner in many Asian developing countries. In addition, improper waste management can significantly contribute to greenhouse gas emissions (see Sang-Arun et al. 2011).

Sustainable waste management and poverty reduction

Green economy is a concept in which the economy is not only concerned with monetary benefits, but also with improving the level of human wellbeing and natural capital systems so that it contributes to prosperity and security. Green economy can contribute to poverty reduction and minimise environmental impacts throughout the business chain. The concept is linked with sustainable waste management when the by-product of one process is used as raw material for another production process, thereby reducing the overall volume of waste. In a green economy,

government and the private sector would invest in waste utilisation projects such as composting, organic farming, and material recycling. Involvement of the private sector in waste management can significantly reduce the burden of local governments. However, government must establish the necessary supportive institutional framework (e.g. regulation, awareness raising campaigns) to ensure there is sufficient economic incentives for private sector actors and for smooth operations.

Good examples of job creation through improved municipal solid waste management can be found across the region. These range from community-based waste utilisation projects, such as composting in Matale, Sri Lanka and Surabaya, Indonesia, to large scale composting facilities, such as can be found in Dhaka, Bangladesh and Bangkok, Thailand. Improved municipal solid waste management can generate jobs for unskilled and skilled workers. The number of jobs created depends on several factors, but, in the case of composting, two jobs per ton of organic waste can be expected on average.

Another area where jobs can be created through improved municipal solid waste management is material recycling. The recycling business contributes significant income to many stakeholders in developing countries, where governments have limited budgets for the construction and operation of recycling facilities. In Phnom Penh, Cambodia the recycling business alone has created income for more than 2,000 waste pickers, even though there is no recycling facility in the country. However, it must be remembered that recycling activities can also create health and environmental problems.

The 3Rs can contribute to various national agendas such as food security, energy sufficiency, poverty reduction and economic growth. As part of the 3Rs, waste reduction and reuse can avoid over consumption and contribute to meeting society's food and energy needs. At the waste treatment stage, nutrient recovery from organic waste by means of composting or anaerobic digestion can contribute to food production. Use of compost and liquid fertilisers from organic waste can sustain or increase crop yields as well as improve soil quality and reduce soil erosion. Energy can be recovered through anaerobic digestion, landfill gas capture, MBT (solid fuels) and pyrolysis (liquid fuels). All of these activities contribute to job creation. At the same time, the 3Rs can reduce household expenses and therefore contribute to poverty reduction and household savings.

Sustainable waste management can provide a wide array of benefits, both for local stakeholders and for the global environment, including resource efficiency, job creation, poverty reduction, avoided detrimental local and global environmental impacts and local economic development. Recently, many international networks have been formed to promote the implementation of sustainable waste management, such as the Global Partnership on Waste Management (GPWM), Regional 3R Forum in Asia, and International Partnership for Expanding Waste Management Services of Local Authorities (IPLA). Publications and outputs from these forums can be downloaded from their websites.

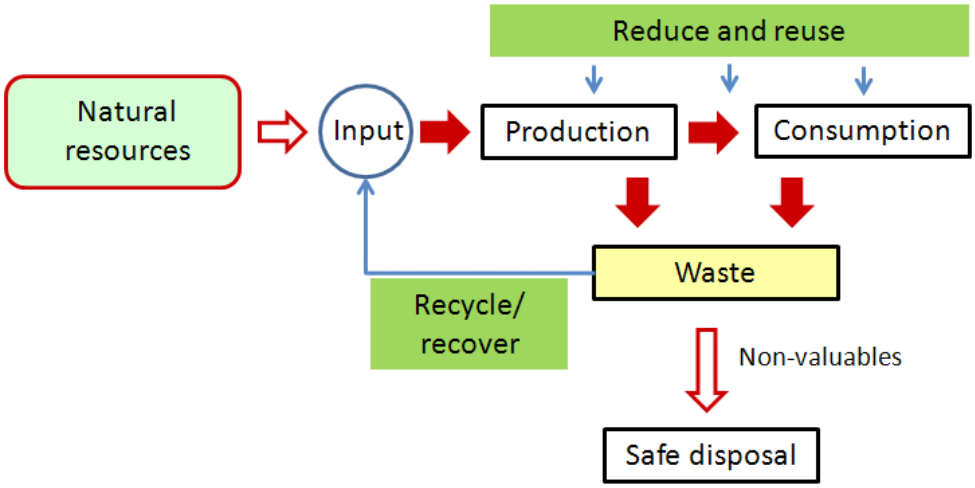
Policy options

Achieving sustainable waste management through mainstreaming the 3Rs (reduce, reuse, recycle), resource efficiency and zero waste policies

Reflecting the personnel and financial constraints facing local governments in developing countries, an integrated approach that includes efforts to reduce waste generation and decrease the volume of waste for final disposal should be considered. Once the volume of waste for collection, transportation and disposal decreases, the budget required for waste management will also decrease.

The *3Rs approach* (reduce, reuse, recycle) can enhance resource efficiency by (i) reducing waste generation at production and consumption stages, (ii) encouraging the reuse of materials and products until they can no longer function properly, and (iii) promoting the recycling of materials for further use and recovering valuable resources such as nutrient and energy prior to final disposal. The 3Rs approach applies to the entire product lifecycle, i.e. all stages of production and consumption including design, manufacture, purchasing, distribution, use and disposal. Many actors can thus participate in the 3Rs, including individuals, enterprises, manufacturers, and local and national governments.

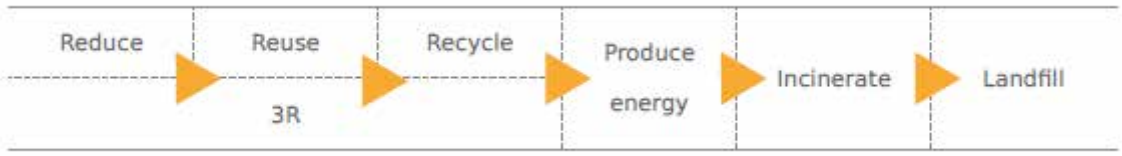
Figure 8:5 Resource circulation through the 3R approach



Source: (Sang-Arun & Bengtsson 2012)

The 3Rs is a basic concept for maximising resource efficiency, though sometimes the 3Rs are further broken down into the 4Rs, 5Rs, etc. For example, The Republic of Korea has introduced the 4Rs (reduce, reuse, recycle, and recovery) and Phitsanulok Municipality, Thailand has introduced the 8Rs (reduce, reuse, reject/refuse, refill, repair, recycle, recovery, and rethinking). Figure 8.6 presents a hierarchy of sustainable waste management based on a 3R concept that is applied in Ulsan, Republic of Korea. *As a goal of the 3Rs is to maximise resource efficiency, the 3Rs should always start with "reduce" and be followed with reuse and recycle, respectively.* Even though the 3Rs is effectively implemented, treatment facilities for non-recyclable waste such as energy recovery system, incineration and sanitary landfill are required for safe disposal of waste.

Figure 8:6 Waste management hierarchy based on a 3Rs concept



Source: (UN 2011)

Implementation of the 3Rs and resource efficiency policy can thus contribute to the long term ambitious target of *zero waste*. These policies shift the focus from end-of-pipe solutions (e.g. sanitary landfill, incineration) and disposal practices toward upstream resource management (e.g. eco-design, new product development), waste utilisation (e.g. composting, animal feed, material recycling), and energy recovery (e.g. electricity generation using heat from waste incineration).

Enhancing environmentally sound material recovery and recycling business

The informal and private sectors are mostly responsible for the material recovery and recycling that takes place in developing Asian countries, mainly due to the lack of government resources. However, many of these activities, especially precious metal recovery from hazardous waste, are potentially detrimental to human health and environmental quality. Regulation, awareness raising and capacity building to ensure basic health and safety standards and environmentally sound practices should be given high priority, as these groups have little knowledge about the health and environmental impacts associated with their recovery and recycling activities.

Avoiding landfill of organic waste and valuable materials

The upgrading of open dumping to sanitary landfill (landfills that have proper soil cover and a leachate treatment system) is a trend in municipal solid waste management in developing countries. Sanitary landfills can have improved sanitary conditions, but valuable materials continue to be buried in the landfills. Rather than being disposed in landfills, organic waste should be separated from other wastes and utilised appropriately, e.g. for animal feeds, composting and anaerobic digestion. Other valuable materials, such as PET and other recyclable plastics, glass, metals, and paper, should be separated for recycling prior to disposal at the final disposal site.

Promoting and regulating waste separation at source

Waste separation at source is the ideal approach to maximise resource recovery and increase the efficiency of waste utilisation. An alternative is to establish a waste sorting facility; however, for local governments in developing countries a *modern waste sorting facility is not recommended* as they are very expensive to construct and as many of them have failed during their operation due to their mismatch with local conditions (e.g. some designs for the bag openers work well in Europe but not in developing Asian countries, and the air-conditioning required in the sorting facilities is more expensive in the tropical climate of South-east Asia). In this case, a local suitable design and construction is recommended instead of foreign import.

A hazardous waste separation and collection scheme should also be established. Hazardous waste can cause serious health and environmental impacts if not disposed of correctly, and sometimes interferes with the smooth operation of waste utilisation facilities, such as anaerobic digestion and composting and reduce the quality of their outputs.

A local government waste separation at source initiative can be promoted through the concepts of *Extended Producer Responsibility (EPR)* and *Corporate Social Responsibility (CSR)* in the national level. In applying these concepts, product manufacturers encourage their customers to separate the waste from the product they purchased and take it back to the shop, and then the shops send the waste back to the manufacturers for appropriate treatment. This can significantly reduce the waste management burden of the local governments.

Promoting community based waste management

Community-based Waste Management (CBWM) is a waste management system under which residents in each community are involved in decisions and actions on waste management. For example, residents may discuss and propose a waste management plan to the local government, practice waste separation at source for composting, and sell valuable waste. Therefore, CBWM can reduce the burden carried by local governments for waste management as waste reduction and waste separation initiatives, and some types of waste utilisation, are carried out by the community. Facilitation of local governments and active participation of local residents are required. Although there are outstanding examples of CBWM in the region, and while it makes good sense to apply CBWM nationally, many local governments and communities in developing Asia are not familiar with this bottom-up approach. Capacity building for both local governments and residents is thus required, and visits to existing CBWM systems can be especially instructive.

Establishing city-to-city cooperation domestically and internationally

While local governments are facing serious problems associated with managing the growing volumes of waste in a sustainable manner, some cities have long experience and some success with sustainable waste management approaches. Lesson learnt and guidance from these successful cities is invaluable and needs to be fully utilised to improve waste management in the region.

Experience across the region

The 3Rs in national solid waste management strategies

Some developing Asian countries have witnessed the benefits of the 3Rs for sustainable waste management and have thus included the 3Rs in their national waste management strategies. For instance, China identified the 3Rs for economic development, resource utilisation, and environmental conservation and rehabilitation through enacting the Circular Economy Law in 2009; India indicated the 3Rs for solid waste management in the National Environment Policy (MOEF India, 2006); and the Philippines announced the Ecological Solid Waste Management Act of 2000 to promote the 3Rs (ed. Hotta 2009).

Bangladesh, Cambodia, Indonesia, Malaysia, the Philippines and Thailand have drafted specific national 3Rs strategic plans. The Philippines will focus its national 3Rs strategic plan on improving the working conditions and livelihoods of the informal sector, which makes an important contribution to waste recovery (ed. Hotta 2009). Viet Nam has announced the national 3R strategy. In addition, Thailand has drafted the Master Law for Promotion of Waste Reduction, Reuse and Recycling to mainstream 3Rs implementation.

The 3Rs in national climate change action plans

Recognition of the 3Rs contribution to climate change mitigation in the waste sector at national levels is on the rise. For instance, China, India, Indonesia, the Philippines, and Thailand included the 3Rs for climate change mitigation from the waste sector in their mitigation action plan. However, knowledge of local governments on this issue is generally poor. Therefore, capacity building for local governments and private sector actors is required.

3Rs implementation at the local level

3R-type activities were being implemented in many cities in the region before national governments included the 3Rs in their national strategies.

The examples in Box 8:6 illustrate the fact that at the local level most 3R activities are focused on separating recyclable waste for sale and the composting of urban organic waste, despite the fact that *the preferable order of the 3Rs is reduce before reuse before recycle*. The wide promotion of recycling is partly due to the obvious benefits from recycling activities, such as income generation for residents and improving the wellbeing of waste pickers. Recycling seems not to be a barrier to business development and economic growth. The 3Rs implementation requires a wide range of stakeholders to be active in cooperating with each other, including the 3Rs initiator, residents, government departments, private enterprises, NGOs, and sometimes international funders.

Box 8:6 Local sustainable waste management initiatives across the region

In Bangladesh, an urban composting project was initiated by the NGO Waste Concern. The composting activity was later scaled up with support from both local and national governments. Extension of the composting was successful due to the on-going efforts of the NGO, an official approval on quality of compost for agriculture, policy support from the Ministry of Agriculture, and a sales agreement with a fertiliser company (Zurbrügg et al. 2004).

In Indonesia, a community based composting project was initiated by an NGO in a small community of Surabaya city in 2004. The activity was later promoted citywide and resulted in reduction of waste for disposal by 13% in 2007 and 23% in 2008. This successful implementation was due to active cooperation between the NGO, local governments, private companies, and international aid agencies. This practice is being transferred to other cities in Indonesia and also other countries (Maeda 2009).

In the Philippines, 3Rs implementation at the local level was driven by the Ecological Solid Waste Management Act (the Republic Act No. 9003), which entered into force in 2002. This Act requires local governments to establish programs for waste minimisation, reuse, recycling, and composting. As a result, 2,361 materials recovery facilities were established serving 6.3% of all barangays (smallest local government unit of the Philippines) in the country. Largely due to the involvement of the informal sector in recycling, the recycling rate rose from 6% in 1997 to 25% in 2007 (Aguinaldo 2008).

Case study: 3Rs implementation for sustainable solid waste management in Phitsanulok Municipality, Thailand

Phitsanulok Municipality is a medium size city located in northern Thailand. The Municipality covers an area of 18.26 square kilometres. Its permanent, official population is approximately 90,000. Due to rapid economic growth and the improvement of the waste collection service, the Municipality was confronted with a rapid increase in the volume of waste for disposal. From 1993 – 1996 waste at the Municipality dump site increased from 50 to 142 ton/day. The Municipality could not handle the waste properly. The waste dumpsites generated a foul smell, were an eyesore, led to housefly outbreaks, and resulted in leachate contamination of the cultivation areas of the local residents in the vicinity.

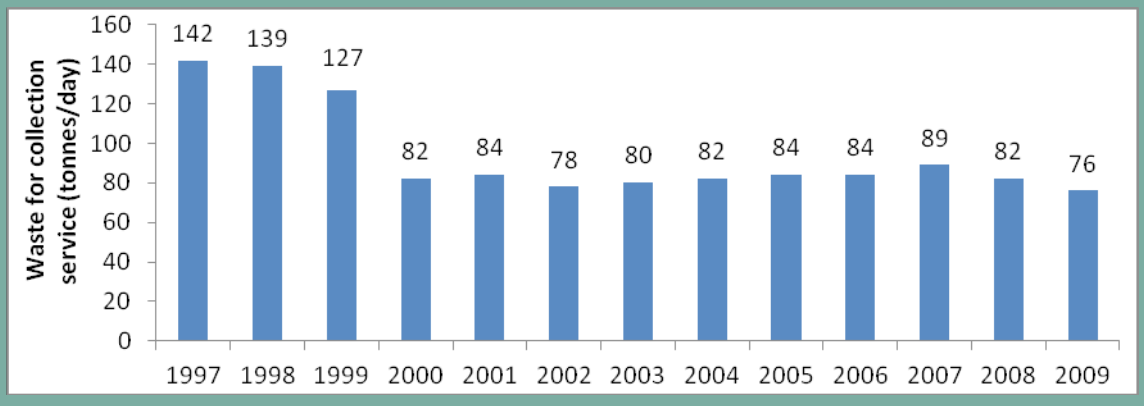
Due to these problems, the local residents forced the Municipality to close several dumpsites. In response, the Municipality gradually upgraded the disposal sites from open dumping and burning to engineered landfill and then to sanitary landfill. However, after a few years the capacity of each dumpsite was exceeded and the Municipality needed to find new and larger locations. The Municipality could not afford to buy land in the vicinity of the town. Therefore, the distance between the disposal site and the Municipality increased, making the transportation of waste expensive.

From 1997, the Municipality introduced various activities to promote the 3Rs in both midstream (consumption stage - waste generation) and downstream (final disposal site). At the consumption stage, the Municipality aimed to avoid waste generation by introducing CBWM for promoting the use of biodegradable and reusable materials, encouraging waste separation for sale, establishing a drop-box system for hazardous waste separation, and supporting composting at household and community levels. Waste buyers and waste pickers were trained under a public-private partnership strategy. After the training, waste pickers were given the title "volunteers for the environment", which was aimed at raising their social status. Educational institutions were involved in awareness raising programs. The Municipality aimed to improve final disposal through the pre-treatment of waste using MBT (composting of mixed waste and separation of valuable waste) prior to landfill.

As a result of these efforts, the quantity of waste transported to the disposal site decreased sharply from 142 ton/day in 1997 to 82 ton/day in 2000, a level that has been subsequently maintained (Figure 8:7). In 2009, through the waste reduction, reuse and recycle efforts, only 76 tonnes/day of waste was delivered to the MBT plant (Figure 8.7) (Phitsanulok Municipality 2011). The number of waste buyer shops and mobile waste buyers has increased by 2-3 times while the numbers of waste pickers have decreased by 50%-75%.

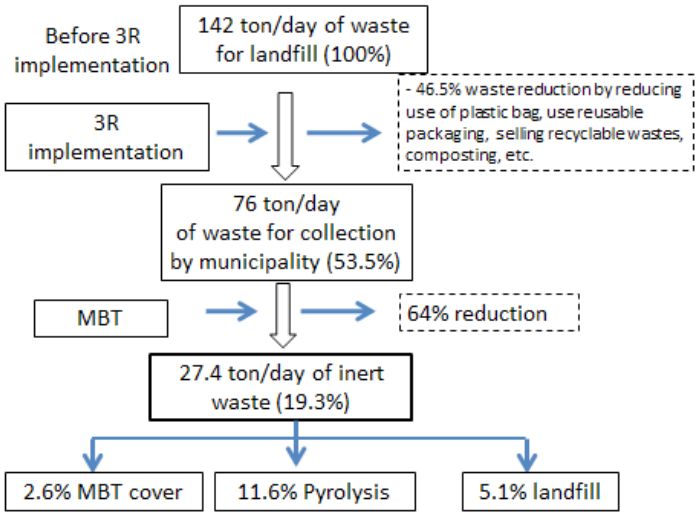
The MBT plant further reduces the quantity of waste by 64%. Of the remaining waste, 13.5% are compost-like products that are used as biofilter for the MBT process, 59.9% is recovered plastic that will be sent to the pyrolysis plant next to the MBT site (converting plastic waste to liquid fuels), and the rest is inert waste that needs to be disposed of in the landfill. The total waste now disposed in the landfill is only 5% of the total waste generated before the implementation of the project. The Phitsanulok Municipality has almost achieved its goal of zero waste. The cost for this program is much cheaper than the alternative of incineration and recycling of incinerated ash.

Box 8:7 Changes of waste for collection after implementation of the 3Rs in Phitsanulok Municipality from 1997-2009



Source: (Phitsanulok Municipality 2011)

Figure 8:8 Waste reduction through 3R practices in Phitsanulok Municipality



Further reading

8.1

Sustainable infrastructure in Asia: overview and proceedings shares a wealth of knowledge and experiences from across the region, and reviews various options and policies to promote eco-efficient and environmentally sustainable infrastructure development. It includes topics such as environmental law, institutions, governance as well as a range of economic instruments that support sustainable infrastructure development

United Nations, Economic and Social Commission for Asia and the Pacific 2007, 'Sustainable infrastructure in Asia: overview and proceedings', *Proceedings from the Seoul Initiative Policy forum on Sustainable Infrastructure*, 6-8 September 2006, United Nations Publication, Bangkok.

Low carbon green growth roadmap for Asia and the Pacific consists of several parts: (1) an overview of the challenges and opportunities confronting the Asia-Pacific region in terms of low carbon green growth and elaborates on the system change required to pursue the new development path; (2) core elements of the system change necessary and the means of implementing the policy options; and (3) eight policy papers, sixty three fact sheets and fifty one case studies.

United Nations, Economic and Social Commission for Asia and the Pacific 2012, *Low carbon green growth roadmap for Asia and the Pacific: Turning resource constraints and the climate crisis into economic growth opportunities*, United Nations Publication, Bangkok.

8.2

Liveable Cities – The Benefits of Urban Environmental Planning presents policy tools and options in addressing sustainability and incorporating environment in urban planning. The case studies presented offer insight on what works, fails and opens up in trying to realise sustainable urban development.

Cities Alliance, ICLEI & UNEP 2007, *Liveable Cities – The Benefits of Urban Environmental Planning*, Cities Alliance, Washington.

Review of sustainability indices and indicators: Towards a new City Sustainability Index Indicators highlights the important role of indicators as measures of success in the management system. Cities of various size and developmental stage can refer to this material for setting the appropriate parameters in urban planning.

Mori, K & Christodoulou, A 2012, 'Review of sustainability indices and indicators: Towards a new City Sustainability Index (CSI)', *Environmental Impact Assessment Review*, vol. 32, pp. 94–106. Available from: ScienceDirect [01 August 2012].

Are we building competitive and liveable cities? - Guidelines for developing eco-efficient and socially inclusive infrastructure provides good reference to eco-efficiency and offers five new ways for city mayors to build competitive and liveable cities.

United Nations, Economic Commission for Latin America and the Carribbean, United Nations Habitat, United Nations, Economic and Social Commission for Asia and the Pacific & Urban Design Lab of The Earth Institute (Columbia University) 2011, *Are we building competitive and liveable cities? - Guidelines for developing eco-efficient and socially inclusive infrastructure*, United Nations, Bangkok.

8.3

Practical guide for improved organic waste management: climate benefits through the 3Rs in developing Asian countries describes the current situation and policies of solid waste management in developing Asian countries and its contribution to climate change; how the 3Rs can contribute to sustainable solid waste management; effective ways to promote the 3Rs; technologies for utilisation of organic waste, illustrated with case studies; and hierarchies for organic waste treatment technology to guide selection of locally appropriate technologies.

Sang-Arun, J, Bengtsson, M & Mori, H 2011, *Practical guide for improved organic waste management: climate benefits through the 3Rs in developing Asian countries*, IGES, Hayama.

A guide for technology selection and implementation of urban organic waste utilization projects in Cambodia describes and analyses urban organic waste management in Cambodia through field surveys and interviews. The authors introduce various organic waste utilisation technologies implemented in neighbouring and other developing Asian countries to assist technology selection. In addition, the authors provide guidance for selection of appropriate technology, based on the 3Rs approach, for implementation of urban organic waste utilisation projects in Cambodia. The report suggests lessons for low income countries.

Sang-Arun, J, Chau, KH, Uch, R, Sam, P 2012*, A guide for technology selection and implementation of urban organic waste utilization projects in Cambodia*, IGES, Hayama.

A Guide for Sustainable Urban Organic Waste Management in Thailand: Combining Food, Energy, and Climate Co-Benefits describes urban organic waste management in Thailand through field surveys and interviews with various stakeholders. The authors also provide a comparative analysis of urban organic waste utilisation technology used in Thailand and a practical guide for technology selection and proper implementation of these technologies. The report suggests lessons for lower middle income countries.

Sharp, A & Sang-Arun, J 2012, *A Guide for Sustainable Urban Organic Waste Management in Thailand: Combining Food, Energy, and Climate Co-Benefits*, IGES, Hayama.

Developing Integrated Solid Waste Management Plan – Training Manual provides guidelines to develop Integrated Solid Waste Management (ISWM) systems based on the 3Rs. The contents included waste characterisation and quantification, assessment of current waste management systems, target setting and identification of stakeholder issues for ISWM, and how to develop an ISWM plan.

United Nations Environment Programme 2009, Developing Integrated Solid Waste Management Plan – Training Manual Vol. 1: Waste Characterization and Quantification with Projections for Future, and Vol. 2: Assessment of Current Waste Management System and Gaps therein, UNEP/IETC, Osaka.

9 Sustainable Public Procurement (SPP)

9 Sustainable Public Procurement (SPP)

Key Learning Points

- Fitting SPP into overall concepts of sustainable development through Sustainable Consumption & Production.
- The relevance of SPP; what part does it play?
- How has SPP been implemented in different countries; the pre-requisites, opportunities and challenges.
- The impact on national economies – the outcomes from successful SPP initiatives.

What is SPP and why is it important?

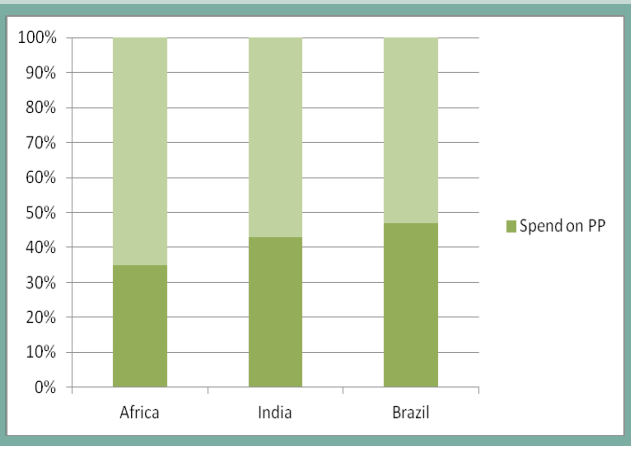
The Marrakech Task Force on Sustainable Procurement accepted the definition of the UK Sustainable Procurement Task Force (2006) : *"a process whereby organisations meet their need for goods, services and utilities in a way that achieves value for money on a whole life basis in terms of generating benefits not only to the organisation, but also to society and the economy, while minimising damage to the environment".*

In the above statement, if the term "organisations" were replaced with "governments" then Sustainable Public Procurement is clearly defined.

Sustainable Public Procurement (SPP) was identified as a major route to sustainable development as far back as the Earth Summit in Rio in 1992 when it featured in Agenda 21. It saw reiteration in the Johannesburg Plan of Implementation in 2002 and more recently, at the 19th Session of the Commission on Sustainable Development in 2011. It forms part of the 10 year Framework of Programmes suggested at the recently concluded Summit in Rio in June 2012.

Procurement of goods and services by the Public Sector – which includes the Central/Federal Government, State/Provincial Governments and even towns and Municipalities - can constitute as much as 50% of GDP. The figure is somewhat lower in developed countries but is highly significant in the developing world. For countries such as South Africa, India and Brazil, public procurement constitutes 35%, 43% and 47% of GDP respectively while for high-income countries, the figure is 13% - 17% (Perera 2010). UNEP places the worldwide figure at between 15% and 30%.

Figure 9:1 Public procurement as a percentage of GDP



In contrast with purchases by individuals/households, all institutional procurement is highly structured and far less prone to the pressures of advertising, publicity, merchandising, in-store promotions etc that the individual is subjected to. In contrast with private sector procurement, public procurement is more easily regulated by government; for the private sector, compliance with sustainability norms is usually voluntarily and linked to a company's policy on Corporate Social (and Environmental) Responsibility.

Another important reason in favour of increasing sustainability in public procurement is that – particularly in less affluent countries – individual consumer purchasing is very highly price sensitive. It is unrealistic to expect an individual consumer set aside price considerations in favour of "loftier" principles of social justice and environmental protection when he or she may be struggling to meet basic survival needs.

Thus if the ultimate goal of SCP is to increase resource efficiency, reduce the impact of anthropomorphic factors on the earth's climate, preserve and protect all forms of life and guarantee the future, then it is obvious that the place to start with is consumption by the public sector. Not only can SPP have a quick impact, but a well-conceived and implemented SPP programme can:

- Serve as an incentive to innovation, as vendors compete with each other to achieve higher norms of sustainability.
- Act as a model for institutional purchasing by the private sector.
- Improve efficiency, as vendors attempt to reach higher levels of sustainability while adhering to conventional criteria such as price, quality and delivery.
- Encourage economies of scale in production by bulk purchases.
- Serve as a demonstration of political will.

SPP and GPP – Preferred Terminology

The difference between *Green* procurement and *Sustainable* procurement is self-evident. The former refers to the environment only whereas the latter refers to the well accepted tripod of sustainability – the environmental, social and economic sustainability of goods and services.

There is a school of thought prevailing which states that for the narrow purpose of sustainable procurement, economic sustainability need not be of too much concern. No loss-making product or service would be offered in the first place and if it were, then it would be for a very definite (social) purpose where sustainability would not be under consideration at all. This is an on-going debate but one which does not materially affect national plans for implementation.

Very often, the two terms are used interchangeably for diverse reasons. For example, the term "green" became associated in Germany with a political party and thus "sustainable" became the preferred adjective (Jensen 2011). In other cases, Governments are wary of using the term "sustainable" since this means different things to different countries and there could be international trade ramifications. For example, wooden furniture is eminently sustainable in Canada, Malaysia or Brazil where wood, a renewable resource, is freely available. However the use of wood for making furniture makes little sense in the desert areas of the Middle East.

The social content of *sustainable* procurement causes a degree of concern to some Governments. The reasoning is that a third party should not apply its own standards and norms to what is or what is not socially acceptable in another nation. While the more contentious issues such as defining child labour have more or less been sorted out, there are still disagreements such as on minimum pay, women at the workplace and working conditions.

Whatever definition a country chooses to adopt, the ultimate goals of its SPP/GPP programme remains constant:

- Tangible increases in resource utilisation efficiency.
- Perceptibly reduced harmful discharges into the air, soil or water.
- Preservation of all forms of life.
- Economic development and reduction of poverty.

The terminology and semantics make little difference; what counts is the ultimate objective.

Policy options and challenges in implementing SPP

No country has been able to implement an SPP programme with ease; there have been obstacles at each step and it is clear that there must be a high degree of political commitment for SPP practices to be adopted. Some of the challenges and barriers are as follows:

Scope: Countries need to determine just what is meant by the "public" sector. Does this term cover central/federal bodies, state/provincial bodies, local/city/municipal government? Does it also include government–aided institutions such as universities and research institutions? What about public-private partnerships and commercial companies partly or wholly owned by the government but which are governed by the provisions of laws relating to corporate governance (e.g. a Companies Act)?

Legislation: Most countries started with no specific laws related to SPP. Legislation has had to be specially drafted and this has often proved contentious since there have been other related laws some of which may have been contradictory – e.g. policies demanding that the Government procures goods and services at the lowest possible price. Paying a higher 'up-front' price is still regarded as an anathema.

Capacities within the Government: Capacity-building has been observed to be a critical component of all successful SPP programmes. The capacity-building needs are not confined to Purchase Managers of Government bodies; users, standard-setting agencies, audit and oversight bodies all require training and sensitisation, appropriate at least to their role in the purchasing process.

Capacity-building of Suppliers: No SPP programme can be implemented if vendors do not have the technical or managerial capacity to supply "greener" goods and services. Successful SPP programmes invariably consider suppliers to be equal partners in the initiative who need to be involved at all stages of development and implementation.

Certification/Verification: Some method of certification and/or verification of sustainability characteristics by independent, third-party agencies is essential. National Ecolabels often fulfil this function but they do not include social criteria. This is possibly why many countries simply focus on environmental criteria and implement Green, rather than Sustainable, Public Procurement programmes - leaving social considerations to other mechanisms.

Creating Unfair Markets: Related to the question of capacity-building of suppliers is the concern that if the "green" standards are set too high, the government could end up creating monopolies. It is also entirely possible that some vendors will need financial assistance to adjust their production processes and methods to different standards. This issue is of special concern to countries which are attempting to develop their own industrial base; domestic suppliers are often unable to compete with MNCs. Often, the fear of creating monopolies is used as a way of maintaining the status quo. As will be evident from Figure 9:2 below, training and capacity development – of purchasers and suppliers alike - is a precursor to an implementation programme for SPP. But equally as often, this apprehension is real and a careful balance will need to be struck.

Life Cycle Analysis (LCA): Nowhere is there a greater need for capacity-building than in the area of LCA. Especially amongst developing countries, the capacity to conduct an LCA is scarce, as is the ability to interpret LCA studies and adapt them to local conditions. While LCA is not essential to the implementation of SPP, at least life-cycle thinking needs to be inculcated amongst stakeholders.

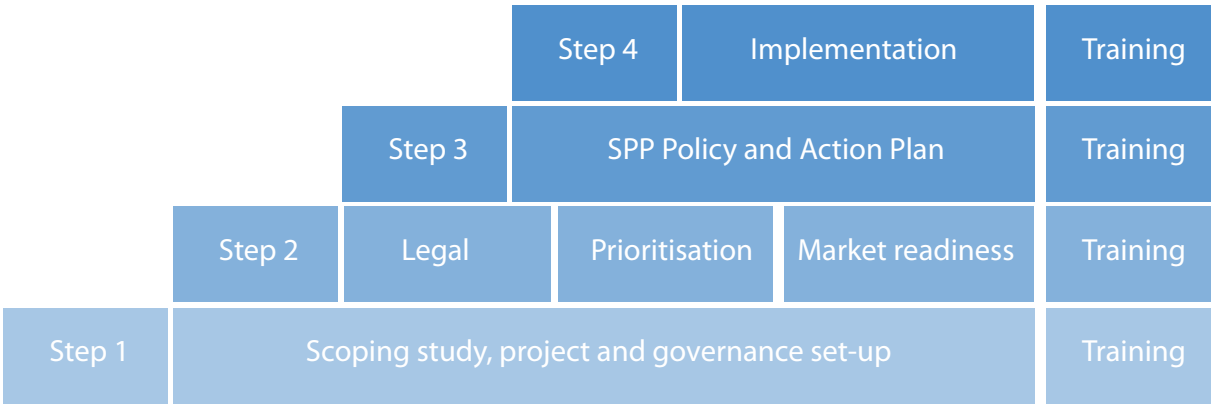
Life Cycle Costing: Building in operating and maintenance costs into the procurement decision is routine; what is not so common is the inclusion of "external" costs such as cost of disposal and costs to the environment by the manufacture and use of goods and services. This has complex budgetary implications as well. In government procurement, the capital expenditure may be incurred by one body whereas the cost of operation, maintenance and disposal may have to be borne by another body.

Inter-Ministerial Cooperation: and dialogue is essential for the success of an SPP programme, since ministries and departments guard their turf zealously.

The design of an SPP programme has to respond to at least the above challenges, possibly more *(From: Meeting Report of the Workshop on Green Procurement in the Indian Railways, 2012, under publication).*

The progress towards implanting an SPP programme is best illustrated in Figure 9:2.

Figure 9:2 The SPP approach steps



Source: (UNEP 2012)

Impact of SPP:

Clearly no country would undertake the arduous task of overcoming such obstacles unless there was definite evidence that SPP had a positive impact on the national economy in particular and the world in general. An effective SPP programme demonstrates that a government is serious about resource efficiency and climate change thus invites individuals and the private sector to follow suit – the "demonstration effect". There are other intangible benefits as well:

- Reduction in CO_2 emissions
- Cost savings, particularly if "external" costs are internalised
- Transfer of skills and technology
- Stimulation of innovative solutions to local requirements
- Minority empowerment
- Job creation
- Wealth creation

In a recent UNEP study (2012), eight case studies of sustainable public procurement from around the world were examined. The study demonstrated that socio-economic goals such as the promotion of local industries, the creation of jobs and the support to micro, small and medium-sized businesses are objectives that can be achieved through sustainable public procurement.

Box 9:1 Environmental Benefits of SPP

Within Asia, a study of 3 Chinese cities (Tianjin, Lanzhou, Qinhuangdo) reported by the Centre for Sustainable Consumption and Production, Wuppertal (2011), revealed the following direct reductions in emissions and resource consumption in one year:

Electricity saved:	20.36	MW
Water Saved:	39,269	KL
Oil saved:	14,008	KL
Waste reduced	24.42	Tonnes
CO2 emissions reduced	105.75	Tonnes

Such figures more than adequately substantiate the role of SPP.

A study conducted by Price Waterhouse Coopers, Significant and Ecofys in 2009 of GPP amongst the "Green 7" countries in the European Union, revealed that in the 10 product groups considered, green procurement ".... contributed to an average reduction in CO_2 emissions in 2006/2007....". Obviously, this depended on the share of a product in the country's basket of procurement with services such as transportation contributing heavily, but CO_2 emission reduction ranged from -9% (Germany) to -47% (Netherlands), too high to be ignored.
Significantly, costs did not go up; rather, they decreased by 1% since Life Cycle Costing was adopted.

Experience across the region

Countries with legislation on SPP:

Most of the developed world has legislation in place supportive of SPP. In the developing world, there may or may not be specific legislation supporting SPP in a holistic manner; sustainable procurement policies and guidelines are often found for different sectors of the economy. For example, India does not have an over-arching law on SPP; instead, there are guidelines stipulating that certain products can only be purchased by the Government if they are produced by registered small-scale industries or handloom weavers or that price preference is to be accorded to purchases from them.

This sector-specificity has led to the evolution of a number of so-called "private" labels standards, sometimes known as "ISEAL labels", after the ISEAL Alliance (previously the International Social and Environmental Accreditation and Labelling Alliance). Examples of product-specific labels or standards include the Forest Stewardship Council, Marine Stewardship Council, Roundtable on Sustainable Palm Oil and Union for Ethical Biotrade. Other such labels relate more to generic sustainable practices and these include the Rainforest Alliance, Sustainable Agriculture Network and Fairtrade. Whilst these ISEAL labels are often adopted by the private sector, their acceptance amongst public procurement agencies is low. Governments tend to favour their own Ecolabelling schemes.

SPP is not merely the purview of central/federal government procurement bodies – it is often practiced by states/provincial governments and even by municipal bodies. ICLEI, Local Governments for Sustainability (2011), lists a number of SPP projects and initiatives undertaken by its 1200-strong membership across the globe.

Within Asia, several countries have broad sustainable development laws and policies which include SPP as a critical component; in fact countries such as Japan have unequivocal laws relating to Sustainable Public Procurement. The following summarises the state of legislation in support of SPP in the major economies of Asia.

China: The legal basis for SPP is found in the Government Procurement Law of 2003. This was greatly facilitated by the fact that the China Environmental Label initiative had been launched as far back as 1997 by the State Environmental Protection Administration, thus encouraging decisions to accord preference to "green" products. In 2006, the Ministries of Finance and Environmental Protection jointly issued the Recommendations on the Implementation of Environmental Labelling Products in government procurement, effectively marking the formal commencement of SPP. The recommendations are applicable at central, provincial and municipal levels. Subsequent policy pronouncements and the 12th 5-Year Plan reinforce the decision to promote SPP. The Global Ecolobelling Network Website (2012) lists 67 product categories of Ecolabels in China and there are said to be some 23,000 ecolabelled products now available.

India: There is no specific legislation supporting SPP at the moment. The long-awaited Public Procurement Policy announced in mid 2012 focused on transparency in the procurement process and makes a passing reference to sustainability, permitting (but not specifying) purchasers to include environmental considerations as one of the "socio-economic" factors which may be included in the criteria for procurement. In the face of fairly rigid pronouncements such as the General Financial Rules (2005) and the Delegation of Financial Powers Rules (1978) which strongly support the lowest price ("L1") criterion for procurement, it is difficult for a purchaser to decide on grounds of sustainability.

Some major procurement bodies such as the Indian Railways overcome the obstacles by crafting specifications in a manner which includes environmental criteria and the Central Government's procurement agency, the Directorate General of Supplies & Disposals, have set examples by unilaterally deciding to purchase environmentally friendly electrical appliances and CFLs (Morton & Gandhi 2011).

Japan: The legislative foundation for SPP in Japan is the **"**Law Concerning the Promotion of Eco-Friendly Goods and Services by the State and Other Entities" enacted in 2000 and enforced since 2001. The law is applicable to all Government organisations and entities, even including universities. The Japanese Ecomark, established since 1989 by the Japan Environment Association, was accepted as the basis for green procurement; this had some 48 product categories with 4400 certified products as at Jan 2009, of which over 17 categories and 204 individual products were earmarked for green procurement by the Government.

Japan was probably the forerunner in insisting that its public procurement agencies must draw up an annual green procurement plan with set targets and then issue reports on performance against the targets (Kataoka 2009).

Philippines: As far back as 2004, the Philippines Government issued Executive Order No.301 which outlined its Green Procurement Programme. In Jan 2012, the Philippines Department of Environment & Natural Resources announced that it had signed an MOU on GPP with other Ministries, viz. Department of Budget and Management (DBM), Department of Trade and Industry (DTI), the Department of Energy (DOE), Industrial Technology Development Institute, Department of Science and Technology (DOST), Philippine Center for Environmental Protection and Sustainable Development, Inc. (PCEPSDI), the Philippine Economic Zone Authority (PEZA), the Development Academy of the Philippines (DAP) and Quezon City local government.

These agencies are also Board members in the National Eco-labeling Program of the Philippines-Green Choice Philippines (NELP-GCP) and thus it should be relatively easy to integrate the eco-labelling programme with the green procurement programme. It is, however, premature to comment on the progress of this initiative.

Republic of Korea: Public agencies are obliged to procure environmentally friendly products under the Green Procurement Law promulgated in 2004 and enforced from 2005. For this purpose, environmentally friendly products are defined as those bearing the Korean Ecolabel or the Korean Good Recycled certification or products satisfying criteria set by the Ministry of Environment. This obligation extends not merely to products but to services such as cleaning, building maintenance etc where eco-labelled products may be used.

Green Purchasing Guidelines are issued every year by the Ministry of Environment and public procurement agencies are required to announce green procurement plans and report on performance against the plans. In the event that "green" products are more expensive than other alternatives, local governments are offered compensating subsidies by the Centre (Kataoka 2009).

Taiwan Province of China: Article 96 of the Government Procurement Act, 1999, followed by the Plan for Implementing Green Procurement by Government Agencies (2001) empowers government procurement agencies to preferentially purchase products bearing the "Green Mark" (Type 1 Ecolabel). There are approximately 94 product categories covered by the Green Mark of which 34 categories comprising items such as office equipment and utilities, water-saving flush toilets, electrical appliances, cleaning supplies etc are considered for the preferential procurement by Government agencies.

A noteworthy feature of their GPP scheme is that it is mandatory for all levels of government procurement bodies to report annually on results (Kataoka 2009).

Thailand: Thailand initiated a "green productivity" strategy in 2004 and recognising that the Government was the largest single consumer of goods and services, the strategy placed emphasis on Public Procurement. By 2005, a mechanism for Green Public Procurement had been proposed and a pilot scheme had been launched. In early 2008, the Cabinet approved a phased plan for adoption of GPP by Government bodies whereby 25% of all public purchasing agencies were to be in compliance by 2008 and a further 25% were to be added each year so that by 2011, 100% of Government bodies were in compliance with the GPP plan. In reality, by 2009 some 67% (target 50%) of Government procurement bodies had agreed to comply.

The plan requires 6-monthly reporting of progress by government procurement agencies to the Pollution Control Dept who, in turn, submits an annual progress report to the Cabinet. Life Cycle Analysis studies had been completed for 20 products by 2007 and by 2009, some 28 products and services came under the purview of the GPP plan. Simultaneously, capacity building of approx 800 public procurement agents was undertaken through seminars and training manuals and notably, this support was extended to the private sector as well, with the result that the private sector is also responding (UNEP 2009).

Other countries in Asia such as Malaysia, Singapore, Viet Nam and Indonesia do not have specific laws promoting SPP/GPP. This is not to say that there is a total absence of any supportive legislation. On the contrary, most countries have some form of legislation governing:

- Industrial pollution and effluent discharge by manufacturing units.
- Waste disposal, including disposal of industrial waste, e-waste, hazardous/bio-medical waste.
- Energy conservation codes, standards and ratings.
- Minimum wages.
- Working conditions.

These proscribe limits for suppliers to the public sector. Some of the more socially and environmentally aware procurement bodies have circumvented "lowest price" regulations and built in environmental considerations into their specifications or vendor qualification processes (see example from India above).

FURTHER READING 9

Procuring the Future – Sustainable Procurement National Action Plan – Recommendations from the Sustainable Procurement Task Force provides an overview of how the U.K implemented SPP, offering insight into strategies for successful SPP implementation.

DEFRA 2006, *Procuring the Future – Sustainable Procurement National Action Plan – Recommendations from the Sustainable Procurement Task Force*, Department for Environment Food and Rural Affairs, London.

Sustainable Public Procurement Implementation Guidelines is recommended for an insight into the challenges and opportunities that are faced during the implementation phase of sustainable public procurement.

United Nations Environment Programme 2012, *Sustainable Public Procurement Implementation Guidelines*, UNEP DTIE, Paris.

Procuring Green in the Public Sector – A Checklist for Getting Started provides a checklist designed for policy makers and people working in public sector procurement, to help get started on green procurement. It also provides a business case for moving towards greener procurement.

Perera, O 2011, *Procuring Green in the Public Sector – A Checklist for Getting Started*, IISD, Available from: <www.iisd.org/pdf/2011/procuring_green_public_sector.pdf>. [September 2012].

10 Sustainable Tourism

Part B

10 Sustainable Tourism

Key Learning Points

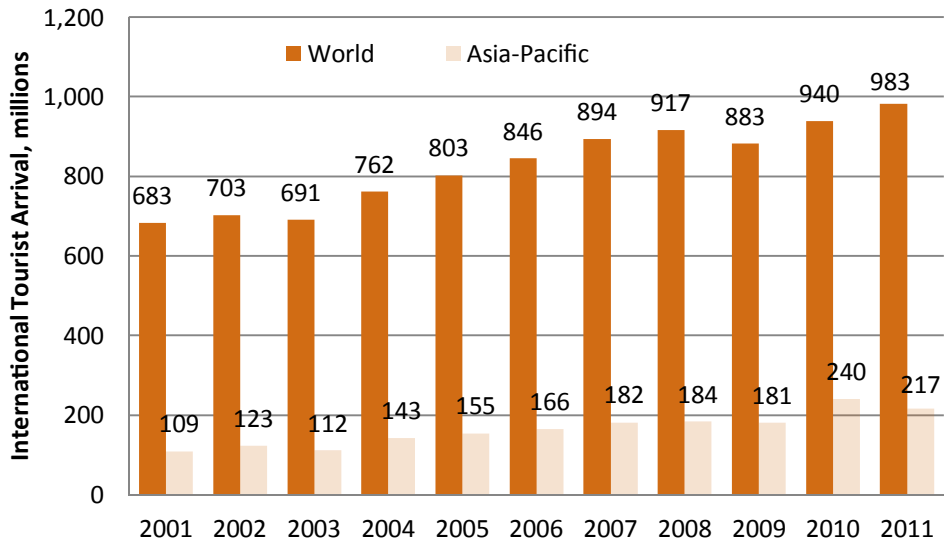
- When is tourism sustainable?
- Sustainability in the different elements of tourism.
- Economic, social and environmental impacts of sustainable tourism.
- Roles of different stakeholders.
- Legislation and voluntary national and international initiatives.

What is sustainable tourism and why is it important?

The magnitude and impacts of the tourism Industry

Tourism is one of the world's largest industries and one of its fastest growing economic sectors. It has a multitude of impacts, both positive and negative, on people's lives and on the environment. According to the UN World Tourism Organisation, international tourism receipts exceeded US$1 trillion in 2011. The Asia-Pacific region, led by China, accounted for 22% of all tourist arrivals in 2010 and growth rates, which flattened during the economic crisis of 2008-09, have been in the double digits in Asia (UNWTO 2011). Tourists arriving in the Region exceeded 200 million in 2010, representing an annual increase of 13% over the previous year. Outbound tourism, led by China and India, registered a 50% rise between 2005 and 2009 (UNESCAP 2011).

Figure 10:1 International tourist arrivals over the last 10 years



Source : (UNWTO 2012)

Domestic Tourism:

The above figures pertain to international tourism; domestic tourism is not so easily quantified principally because there are difficulties in its definition. Nevertheless, a report issued in 2008 jointly by the UNWTO and UNEP in collaboration with the World Meteorological Organisation places domestic tourists in 2005 as being over 5 times the number of international tourists, but this varies from country to country. In China (2005) the ratio of international to domestic tourists was 1:26. In India (2003) it was 1:110 and in Thailand (2005) and Viet Nam (2003) it was 1:7 and 1:5 respectively (UNESCAP 2007).

The Global Sustainable Tourism Council estimates that tourism contributes to 5% of the economic activity of the world and about 7% of employment.

These millions of tourists are already consuming and will continue to demand enormous quantities of energy, water, and natural resources to support their holidays and thus will put additional pressure on ecosystems and natural resources. They will bring income to local communities and will support employment. At the same the increasing demand for basic services and goods from tourists will often cause price hikes that negatively affect local residents whose income does not increase proportionately. As with any productive sector, tourism

brings negative impacts and positive effects for the environment, the society and the economy at local, national and global levels.

The overall review and estimation of tourism's final contribution to the sustainable development of a destination is done on a case by case basis and includes a number of impact areas that should be reviewed. For a detailed discussion on these impact areas please refer to http://www.unep.fr/scp/tourism/sustain/impacts/.

Box 10:1 The Tourism Industry and Climate Change

Tourism is both a cause of and is affected by climate change and environmental degradation. Air travel for example, causes atmospheric pollution by definition and hotels, particularly those in remote locations, place a significant burden on infrastructural facilities such as sewage and waste treatment and water and electricity supply. Simultaneously, tourism is affected by climate change: the choice of destinations is often dependent on the expected climate and many tourist activities such as skiing, trekking or surfing are climate-driven.

Since so much of tourism is climate-dependent, any changes could have a significant impact on the desirability of destinations and thus the flow of tourist traffic. Some predict that with global warming becoming a reality, there will be a shift in preference from the lower latitudes with warmer climates to the higher latitudes and cooler climates.

Definitions, Precepts and Misconceptions

With one of the most complex supply chains of any industry, a set of numerous positive and negative impacts and with ambiguity regarding the nature of tourism as an industry, a sector or an economy cluster, defining "sustainable tourism is not an easy task.

The most widely accepted and commonly used definition of sustainable tourism (UNWTO 2004) is the following: 'Sustainable tourism development guidelines and management practices are applicable to all forms of tourism in all types of destinations, including mass tourism and the various niche tourism segments. Sustainability principles refer to the environmental, economic, and socio-cultural aspects of tourism development, and a suitable balance must be established between these three dimensions to guarantee its long-term sustainability'

UNWTO further stipulates that Sustainable Tourism should:

- Make optimal use of resources, maintain essential ecological processes and conserve natural heritage and biodiversity.
- Respect the social and cultural heritage and value systems of host communities and contribute to greater understanding and tolerance.
- Ensure economically viable operations and that the socio-economic benefits are distributed equitably amongst all stakeholders.

Box 10:2 Critical challenge for tourism

The critical challenge before the global tourism sector is to develop a coherent policy strategy that decouples the projected massive growth in tourism in the decades ahead from increased energy use and GHG emissions, so as to allow tourism growth to simultaneously contribute to poverty alleviation and play a major role in achieving the United Nations Millennium Development Goals (MDG).
(UNEP-WTO-WMO 2008)

A term that is many times used in parallel or as a substitution to sustainable tourism is the term "ecotourism". There are hundreds of definitions of ecotourism and in general most of them consider that ideally ecotourism is "nature based tourism that embraces the principles of sustainable tourism". According to the Quebec Declaration on Ecotourism (adopted in 2001 during the UN International Year of Ecotourism), ecotourism 'embraces the principles of sustainable tourism and the following principles which distinguish it from the wider concept of sustainable tourism are:

- Contributes actively to the conservation of natural and cultural heritage.
- Interprets the natural and cultural heritage of the destination to the visitor.
- Lends itself better to independent travellers, as well as to organised tours for small size groups" (2002).

Unfortunately in recent years, the term ecotourism has been literally abused and used to describe activities that have no relation to real ecotourism. Some desert hotels and resorts, where water is scarce, boast of jacuzzis, bathtubs and swimming pools. Ecotourism voyages to Antarctica have posed serious threats to bird and marine life in a fragile ecosystem while the route to Mount Everest is littered with human refuse and even corpses. Principles of sustainability could well be applied to such examples of tourism but it is quite unfortunate that many of these activities are described as ecotourism while they are practically "nature based tourism".

Sustainability in tourism is not just about the environment; equally important is the effect of tourism on the culture, heritage and economic wellbeing of stakeholders. All tourism needs to be made more sustainable since the existing infrastructure is often unable to cope with the demands of tourists.

Box 10:3 Differences between tourists and locals

In developing countries per capita daily use of water by tourists can be 10-15 times that of the local community (UNEP-WTO 2005). In Phuket, Thailand, tourists generate 2.2 kg of solid waste per person per day versus a Thailand average of 0.65 kg. (World Bank 2003). Tourism is by nature seasonal and this has an impact both on the infrastructure as well as on local employment. Infrastructural investments for assets (e.g. roads or power generating capacity) which are used only for a limited period of the year can be very expensive and it puts a great socio-economic strain on the local community to be employed for only part of the year.

Policy options for sustainable tourism

Policy Tools for Sustainable Tourism

Tourism is almost invariably a private sector activity. Thus the government's role is dual. On the one hand, it must act as a facilitator by providing the necessary infrastructure for tourists, promoting attractions and encouraging tourist arrivals. On the other hand, government's role is to enforce laws of the land and these may, in some cases, be in conflict with its role as a promoter of tourism. A delicate balance has to be maintained and this is where voluntary initiatives such as the Global Sustainable Tourism Council (GTSC) certification scheme play a critical role: there is no confrontation since the industry has voluntarily agreed to follow norms which will not only meet but frequently exceed the requirements of the law.

Addressing the main challenge of integrating sustainability in tourism development policies, a set of policy recommendations have been develop by UNEP in partnership with UNWTO to set an agenda for policy making in the area of sustainable tourism. The recommendations are based on a list of 12 principles for sustainable tourism development. These principles were reached after extensive research and consultation in international forums and can be used as a framework to develop policies for sustainable tourism, that recognise the two directions in which tourism policy can exert an influence:

- Minimising the negative impacts of tourism on society and the environment.
- Maximising tourism's positive and creative contribution to local economies, the conservation of natural and cultural heritage and the quality of life of hosts and visitors.

The 12 principles are summarised below.

- **Economic viability**: Ensure the viability and competitiveness of tourism destinations and enterprises, so that they are able to continue to prosper and deliver benefits in the long term.
- **Local prosperity:** Maximise the contribution of tourism to the prosperity of the host destination including the proportion of visitor spending that is retained locally.
- **Employment quality:** Strengthen the number and quality of local jobs created and supported by tourism, including the level of pay, conditions of service and availability to all without discrimination by gender, race, disability or in other ways.
- **Social equity:** Seek a widespread distribution of economic and social benefits from tourism throughout the recipient community, including improving opportunities, income and services available to the poor.
- **Visitor fulfilment:** Provide a safe, satisfying and fulfilling experience for visitors, available to all without discrimination by gender, race, disability or in other ways.
- **Local control:** Engage and empower local communities in planning and decision making about the management and future development of tourism in their area, in consultation with other stakeholders.
- **Community wellbeing:** Maintain and strengthen the quality of life in local communities, including social structures and access to resources, amenities and life support systems, avoiding any form of social degradation or exploitation.
- **Cultural richness:** Respect and enhance the historic heritage, authentic culture, traditions and

distinctiveness of host communities.

- **Physical integrity:** Maintain and enhance the quality of landscapes, both urban and rural, and avoid the physical and visual degradation of the environment.
- **Biological diversity:** Support the conservation of natural areas, habitats and wildlife and minimise damage to them.
- **Resource efficiency:** Minimise the use of scarce and non-renewable resources in the development and operation of tourism facilities and services.
- **Environmental purity:** Minimise the pollution of air, water and land and the generation of waste by tourism enterprises and visitors.

On the basis of these 12 principles a broad number of specific instruments are available to policy-makers. These include:

- Measurement instruments which set indicators and identify the limits.
- Command and control instruments, such as legislation/regulation and licensing.
- Economic instruments – taxation/levies and incentives.
- Voluntary instruments such as the certification, reporting and auditing.
- Supporting instruments such as infrastructure development, capacity building and marketing.

These are discussed in detail in the UNEP-WTO publication "Making Tourism More Sustainable" (2005) which should be referred to by policy-makers.

Tourism and Poverty

One of the most important challenges that sustainable tourism policies should address is the challenge of poverty. Looking at the location of poverty in the world and then at tourism flows, two key points emerge. First, tourism often plays a major part in the economy of poor countries. Tourism is the principal export in a third of all developing countries and, amongst the 49 Least Developed Countries (LDCs), it is the primary source of foreign exchange earnings. Secondly, tourism is growing much faster in developing countries than in developed countries. Therefore tourism, if well and sustainable managed, has great potential to alleviate poverty and contribute to local development.

Tourism is a labour-intensive industry by definition. Universally, tourism has both a direct and indirect impact on employment and the beneficiaries are both international and local labour. There is considerable evidence to suggest that a rise in tourist arrivals leads to a rise in employment in the host destination and vice versa. Tourism can also be highly capital intensive and can lead to a significant inflow of Foreign Direct Investment. The combination makes tourism a highly desired industry by most governments.

Although tourism has significant potentials as a driver of local development and poverty alleviation, there are a number of challenges to be met if this potential is to be realised. These challenges include issues of ownership, economic leakage (from the local economy and through imports), local employment, benefit distribution, social and environmental impacts and dependency. These problems can only be effectively addressed at the destination level with the active participation of the local communities.

UNESCAP (2003) clearly spells out how sustainable tourism can assist in poverty alleviation. It summarises by stating that "The effective development, execution and management of a successful pro-poor tourism strategy reaches far beyond local communities. It can:

- Enhance a country's international profile.
- Open the door to new investment.
- Raise living standards.
- Provide additional funds for education and training.
- Stimulate economic growth.
- Bring about environmental reforms.
- Develop a group of innovative entrepreneurs.
- Create new business opportunities.

Recent interesting initiatives have been trying to mainstream the use of tourism as a driver for poverty alleviation. Research indicates that these initiatives are promising but there is still a great amount of work to be done. For example, a paper by Manyara & Jones (2007) indicates that community priorities are often inadequately addressed by initiatives of pro-poor tourism. Furthermore a DFID study on the effects of tourism in poverty concluded that "the conventional focus on international tourism and foreign exchange has missed the potential to enhance the benefits of tourism for the poor and failed to minimise costs on the poor".

Box 10:4 The impacts of tourism

Tourism can, for example, provide employment for local people but it can also contribute to an increase in their cost of living, e.g. housing, food. It can give visitors a greater understanding and appreciation of people from diverse backgrounds but it may result locally in a disruption of traditional customs and traditions. It can improve roads and infrastructure but it may require communities to raise taxes for additional services. It can provide better recreational and cultural facilities but also create overcrowding, traffic congestion, litter, vandalism and crime (UNESCAP 2003).

Multilateral Agencies and Sustainable Tourism

There are a number of multilateral agencies industry bodies and NGOs working on Sustainable Tourism.
UNWTO: Foremost amongst these is UNWTO. Started as the World Tourism Organisation in 1970 when its statutes were adopted, it became a working entity in 1975 with Headquarters in Madrid and joined the UN system in 2003, becoming known as UNWTO. UNWTO is not intended solely to promote sustainable tourism, it has a broader canvas; it however describes itself in its Website as follows: "UNWTO promotes tourism as a driver of ***economic growth, inclusive development*** and ***environmental sustainability,*** and offers leadership and support to the sector in advancing knowledge and tourism policies worldwide."

Marrakech Task Force on Sustainable Tourism: UNEP sponsored the creation of 7 Marrakech Task forces following the decision taken at the International Experts Meeting on Sustainable Consumption & Production in Marrakech in 2003, which marked the commencement of the "Marrakech Process". Following the recommendations of the Johannesburg Plan of Implementation (JPOI) that "developed countries must take the lead" in accelerating the shift towards more sustainable consumption and production, each of the Marrakech Task Forces was chaired by a developed country. The Task Force on Sustainable Tourism was thus chaired by France and comprised members from 18 countries representing 17 businesses, international organisations and NGOs. It supported over 40 projects worldwide and conducted a series of meetings of stakeholder groups.

Global Partnership for Sustainable Tourism: The work of the Marrakech Task Force was handed over in 2010-11 to the Global Partnership for Sustainable Tourism. It has 83 members from government, industry and NGOs and has the following objectives:

- Bring together international organisations, governments, civil society and tourism trade groups as members of the Global Sustainable Tourism Partnership and get them involved in its activities.
- Encourage networking among members and facilitate access to information about sustainable tourism.
- Strengthen, coordinate and encourage the adoption and implementation of sustainable tourism policies.
- Disseminate information about success stories.
- Scale-up, adapt and replicate successful projects and initiatives.
- Establish and implement innovative, multi-stakeholder projects that support sustainable tourism development around the world.

Global Sustainable Tourism Council: The UN Foundation, with the support of UNEP, UNWTO and other leading international bodies set up the Global Sustainable Tourism Council (GSTC), now headquartered in Washington DC. The GSTC describes itself as "a global initiative dedicated to promoting sustainable tourism practices around the world". Its stated objectives include:

- Promotion of international standards on sustainable tourism.
- Promotion of sustainable tourism destinations.
- Promotion of market access.
- Education and training on tourism sustainability.
- Accreditation for standards and certification programmes.

Of these, perhaps the most significant is the development of the Global Sustainable Tourism Criteria, the latest revision of which was published in March 2012. The initiative commenced in 2008 and involved some

50 expert organisations which reviewed over 60 certification schemes and 4500 criteria, inviting comments from 2000 stakeholders. The result of this massive exercise was a set of principles and indicators under 4 objectives:

1. Demonstrate effective sustainable management.
2. Maximise social and economic benefits to the local community and minimise negative impact.
3. Maximise benefits to cultural and historical heritage and remove negative impacts.
4. Maximise benefits to the environment and minimise negative impacts.

Under each objective, several principles were listed and indicators were developed for each principle. Applicable to hotels and tour operators, the GSTC provides the flexibility of adapting to a country's particular needs and a certification/accreditation procedure has also been developed simultaneously. The GSTC criteria have been adopted by a number of major hotel chains and tour operators around the world. (See suggested Further reading at the end of this Chapter)

Private Initiatives: There are several private initiatives promoting sustainable tourism such as Green Globe which also has sustainability criteria – common in many cases to the GSTC criteria – and a certification scheme.

There are, therefore, a large number of organisations and networks providing guidance to the tourism industry on how to transition to more sustainable practices, along with audit and certification schemes aimed at preventing "green-washing". Simultaneously, there exist initiatives such as the Green Passport for consumer education and Envirotel for educating the small and medium players in the hospitality industry.

Hotels and tour operators are increasingly advertising their green certification status in publicity materials and it is the declared intent of travel and hospitality websites to actively promote such certified businesses. There is evidence that an increasing number of tourists are responding to these efforts.

Box 10:5 Sustainable tourism in the South Pacific Islands

Recognising the importance of sustainable tourism, an initiative is underway in the South Pacific Islands of Fiji, Vanuatu, Samoa and Palau. Working with the South Pacific Tourism Organization (SPTO) these countries are enhancing their ability to manage climate change adaption within the tourism sector. The project focuses on the following three areas:

- Educating existing and new tourism entities on the issue of climate change.
- Constructing and implementing a climate change adaptation strategy for community-based-tourism initiatives.
- Incorporating considerations of climate change into national tourism development strategies and plans. (GTZ & SPREP n.d.)

The role of business

Tourism is an industry where small and large businesses co-exist and often have a symbiotic relationship. In the accommodation sector, hotels may be owned or operated by a global chain but bed-and-breakfast rooms, inns and home-stays also thrive in the very same environment. The transportation sector includes not only airlines and railway networks but also the driver-owned and operated taxi, mini-bus or rickshaw and tuk-tuk.

Basic principles of sustainability apply across the board, irrespective of size. Energy conservation, for instance, applies equally to a small inn as to a large hotel, to a taxi driver as to an airline.

There is no real reason to use construction material (such as flooring) imported into Asia from Europe, or for exotic woods from Africa and South America. Yet such materials are prolifically used in the larger "luxury" hotels. Restaurants will serve food imported in refrigerated condition from thousands of miles away, often in preference to fresh, locally available produce. Again, this is found mainly in the upper-end luxury hotels and dining establishments. In the Asia-Pacific region, which boasts of some of the world's greatest cuisines, it is astonishing that that luxury continues to be defined by some by Western standards.

Sustainable tourism can in fact pay back for itself and there is a sound business case for it. In some instances, it may involve higher initial investments – for example in the installation of water or energy-saving devices. Technology may also be difficult to acquire, particularly for small businesses. But the major challenge comes from the fact that mindsets need to be changed.

Fortunately, there is increasing realisation of the errors of the past and many individual hotels and chains have very successfully and profitably implemented corrective measures.

It is a more difficult task to persuade individual tourists. Many are simply over-awed by the "exotic" or "foreign" nature of their surroundings and dietary choices. Measures such as UNEP's "Green Passport" initiative may help in small ways but there is no quick-fire solution. The onus must rest on the suppliers of tourism-related services to simply stop offering what is clearly unsustainable and communicate the intentions properly to their clients.

Tourism businesses are sometimes quite reluctant to be pioneers in implementing sustainable practices, since these often require up-front investments which take time to recoup. Providing subsidies or tax breaks for such investments is a potential way of overcoming this reluctance but it should be seen as an approach that is applied only when the private sector is really committed to contribute to sustainable tourism.

Country Comparisons and the need for Impact Assessment

Inter-country comparisons of the impact of sustainable tourism are not always meaningful. Comparisons between developed and developing countries are particularly irrelevant because of the different ways that nations have grown. Even within Asia-Pacific, the level of implementation varies significantly within countries and the relative importance of the different elements varies even more. For instance, waste minimisation is of critical importance to a small island that simply does not have the land area for sanitary landfills. In a water-stressed or desert area, the critical need would be water conservation. Instead, each country (and possibly areas within each country) needs to look at the impact that tourism has had on:

Box 10:6 Society

- What is the level of employment generated by tourism – direct and indirect?
- What is the quality of that employment – are locals being employed for menial tasks or are they also represented in higher management echelons?
- Is training provided to local staff to enhance skills and upward mobility?
- Are wages and working conditions in conformity with the law and with the practice of the industry/ the business elsewhere?
- Is land, water or any other resource being utilised at the expense of the local community?
- To what extent are local materials and foodstuff used in the establishment and operations of the business?
- Do the operations encourage local arts, crafts?
- Is the local heritage – particularly buildings, monuments, and archaeological and natural sites unharmed?
- Is the traditional right-of-way and access being denied?
- Are local value systems and traditions accorded due respect? In particular, are women and children given due respect and consideration?
- Has tourism led to the creation of undesirable activities such as prostitution, and is the local community being exposed to unhealthy or undesirable practices?

Box 10:7 Environment:

- Has tourism caused any damage to the flora and fauna of the region?
- Has any building or construction caused an unnatural diversion of rivers, streams and waterways?
- Is the land, air or water source (including underground aquifers) being polluted by effluent discharge and the use of toxic chemicals?
- Are exotic and non-indigenous species of flora being planted?
- Does a proper waste management system exist to cope with tourist arrivals?
- Do tourist establishments practice water and energy-conservation measures?

Box 10:8 Economy:

- How much revenue has been generated by tourism (international and domestic)?
- How much of the revenue is retained within a) the country and b) within the areas?
- How has the income been distributed? Does the local community retain a fair share or does it accrue largely to outside investors?
- Is the income likely to be sustained or is it transient?
- Is it likely to invite additional investment in legally permitted activities?
- Are investments coming in from legitimate sources?

Further reading 10

The Global Sustainable Tourism Council for Hotels and Tour Operator's website provides a list of the Principles of the GSTC criteria, the minimum criteria that any business or tour provider should aspire to reach.

Global Sustainable Tourism Council 2012, Global Sustainable Tourism Criteria for Hotels and Operators. Available from: <http://www.gstcouncil.org/resource-center/sustainable-tourism-gstc-criteria/criteria-for-hotels-and-tour-operators.html>. [September 15 2012].

Making Tourism More Sustainable – A Guide for Policy Makers is essential reading for policy makers, providing practical policy advice for adopting sustainable tourism practices.

UNEP-WTO 2005, *Making Tourism More Sustainable – A Guide for Policy Makers,* UNEP & WTO, Paris.

UNEP's Green Passport initiative provides tips to travellers on green tourism with information to read before, during and after you travel. It is a source of information on how to influence tourists and educate them about responsible tourism.
United Nations Environment Programme 2012, *Green Passport – Holidays for a living planet*. Available from : <www.unep.fr/greenpassport>. [September 15 2012].

ECOTRANS is a European multi-stakeholder network of experts and organizations engaged in sustainable tourism. The website provides information and advice on all facets of sustainable tourism.
ECOTRANS n.d., *Ecotrans-Projects*. Available from: <www.ecotrans.org>. [12 September 2012].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OVERARCHING POLICY OPPORTUNITIES

11 Fiscal Reforms

12 Redefining Education for SCP

13 Energy Efficiency

11 Fiscal Reforms

Key Learning Points

- There are a number of economic instruments available for SCP.
- These include cap and trade, 'polluter pays', ecological budget and tax reform and removing subsidies.
- Ecological budget and tax reform can generate multiple dividends (environmental, employment, efficiency).

Ecological budget and tax reform for SCP

Since the end of the 20th century there has been evidence of a changing economic context in which the price of natural resources has been rising and becoming increasingly volatile. This suggests that resource efficiency should become a priority of national governments' policy planning and should also play a major role in strategies in the private sector. At the same time, climate change driven by rapidly increasing global CO_2 emissions has also become an urgent political topic, indicating that significant efforts are needed to curb global emissions. Comprehensive policies for increasing resource efficiency and reducing emissions are needed to deal with rising natural resource prices and to mitigate CO_2 emissions.

Ecological budget and tax reform is a means of steering economies in Asia and the Pacific towards greater resource efficiency, lower emissions and sustainable consumption and production. Such economic instruments can shift production costs away from labour towards natural resources and emissions. Economic instruments are the most cost effective and efficient way of changing incentives to guide consumers and producers towards lower resource and emissions intensity in their daily consumption, and in the way production processes in businesses are organised. There is a suite of economic instruments available to achieve this including:

- Cap and trade systems for resources and emissions.
- Special charges based on the 'polluter pays' principle.
- Ecological budget and tax reform.
- Removing subsidies for large consumers of, for example, energy and electricity.

If applied correctly and often in combination with command and control approaches, economic instruments can help to:

- Increase prices of environmentally damaging goods and services, while increasing the returns for more sustainable approaches - leading to more sustainable production and consumption patterns.
- Reduce compliance costs by providing flexibility to polluters or users of natural resources to choose the most cost-efficient and environmentally effective measures.
- Minimise the overall cost of achieving a given pollution control target.
- Create dynamic incentives for investments to innovate and continually improve environmental technology, generating both environmental and financial benefits ("win-win").
- Allocate property rights and responsibilities of firms, groups, or individuals so that they have both the incentive and the power to act in a more environmentally-responsible manner.
- Raise revenues that can be used for environmental purposes or for social benefits (e.g. decreasing income taxes).

Among these economic instruments, ecological budget and tax reform appears to be the most far-reaching and advantageous instrument. It can be designed in a cost neutral way, so as not to increase the total tax burden. This would allow the costs of natural resources and emissions to be increased dramatically, by up to 5%–10% of GDP. As overall production costs would remain stable, the likelihood of opposition from businesses should be substantially reduced, and business leaders could focus on process innovation.

A well-designed ecological budget and tax reform would yield a triple dividend of reduced environmental pressures and impacts, increased employment and growth in efficiency. It would potentially also have positive distributional effects.

Policy options for fiscal reform

During most of the 20th century, the price for natural resources (energy, water, metals and food) was low because of abundant endowments and very affordable extraction methods. Many reserves offered easily accessible, high-grade materials. As a result, the cost of natural resources for production was only around 5%

of the total input costs and was therefore ignored by most businesses and governments. Most of the effort and investment went into increasing labour productivity, very much in line with standard economic theory, at the cost of a wasteful approach to natural resource use and ever increasing amounts of waste and emissions. There is ample evidence that the time of low prices for natural resources has ended. Over the past ten years the prices of many natural resources have grown substantially and have also become increasingly volatile. This has been driven by the growth dynamic of Asia-Pacific (see section 1.3) and the large amounts of natural resources that have been required to fuel the industrial transformation in many Asian developing economies, most notably in China and Southeast Asia. Urbanisation and industrialisation processes have altered resource use patterns and an emerging middle class is engaging in new lifestyles and consumption behaviours. In aggregate, this has underpinned the growth dynamic of natural resource use and emissions in Asia-Pacific.

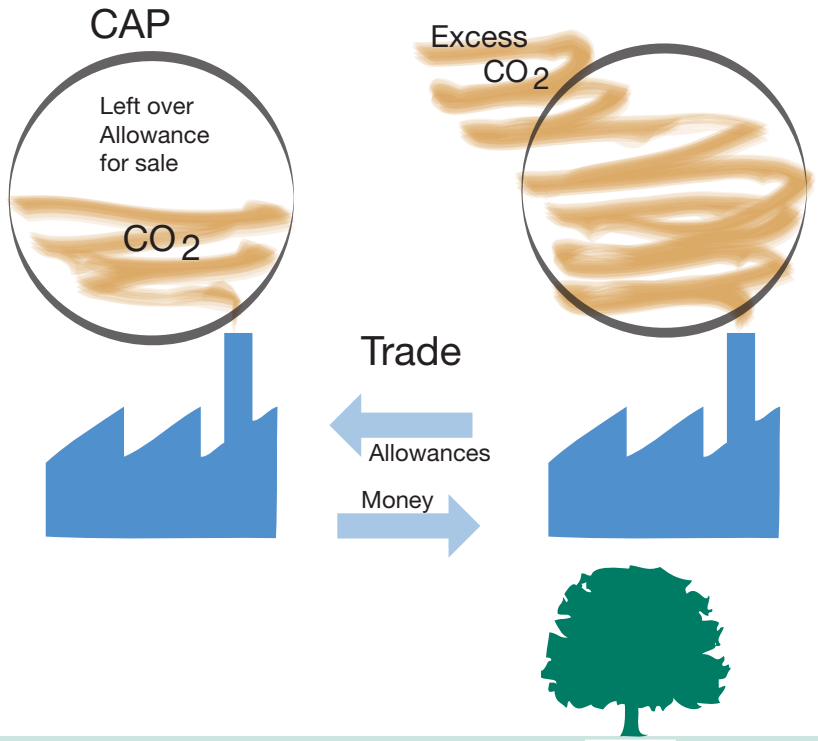
Increasing the productivity of natural resources and energy

The large increases in consumption of food, energy, water and metals resulting in environmental and resource consequences over the past decade can be dealt with in two ways. There must either be a drastic reduction of natural resource use through reduced consumption of goods and services, or resource efficiency needs to increase. The potential for resource efficiency gains is indeed very large in many parts of the economy, in particular for housing and construction, mobility and transport, food and agriculture as well as in heavy industries and the manufacturing of consumer goods.

In some areas, resource efficiency gains could be as large as 80%. This would involve large improvements in energy efficiency, switching to low carbon renewable fuels, heat and power recovery, changed feedstock, product innovation and large scale improvements in material efficiency such as through lightweight materials in the building sector, and reuse and recycling systems. Achieving these changes will require moving from labour productivity to resource productivity, encouraged and steered by economic instruments. In the following four sections such instruments are discussed and it is argued that ecological budget and tax reform may have the greatest capacity for steering economies towards sustainable consumption and production.

Cap and trade systems for resources and emissions

Cap and trade systems are most useful when a goal for natural resource use or emissions reduction has been established based on scientific analysis, such as for greenhouse gas emissions. In such a case the amount of tradable permits would establish the desired consumption and emissions levels of a natural resource or an emission, establishing the cap. Permits would be traded on the market. The market mechanism of supply and demand would result in a price which each consumer or emitter would have to pay, in addition to the cost of the raw material procured. More ambitious goals for reducing natural resources or emissions would be achieved by reducing the number of permits further leading to additional price increases. Businesses and consumers would be encouraged to implement resource efficiency measures to offset the price rises. This would lead to innovation in production technologies, investments in green infrastructure and changes in consumption behaviour.



Greenhouse gas emissions price setting by tradable permits, including a cap for total emissions, is one of the most important policy options for mitigating climate change. It is both a cost effective and efficient way of influencing the behaviour of businesses and households and guiding them towards resource efficiency and low carbon strategies. There are, however, a number of institutional issues on how to best design and implement a cap and trade system. Most importantly, policy needs to deal with the fact that there will be winners and losers from the introduction of such an economic instrument and that there will be a need for compensation for high emitters during a transition period, and for low income households which will be facing price rises for electricity and transport.

There are numerous challenges in designing and implementing a cap and trade system.

- First, a compromise on an overall reduction goal for emissions needs to be achieved and there will be groups interested in more or less ambitious reduction goals. In practice, this may mean that influential players who have an interest in less ambitious goals may prevail in the discussion. If this occurs, political negotiations might result in creating a toothless instrument that does not have the required capacity.
- Secondly, the level of compensation is an important design criterion. If for example, the level of compensation for large polluters is set too high or the transition period is too long, this may adversely affect the price of permits and may lead to a very low price with little capacity for steering the macroeconomic changes required. On the other hand, during periods of economic booms the price of permits could rise unpredictably, threatening investment and disproportionately increasing the risk for businesses.
- Thirdly, the concept of tradable permits for emissions relies on readily available, accurate and credible emission accounts of governments and businesses, which can only be expected for some emissions, some natural resources and for some countries that have advanced statistical reporting.
- Finally, since many of today's economic processes are globalised, a system of tradable permits at some point would need to be implemented internationally. There are likely to be trade-offs between the optimal allocation instruments at national and international levels, which would need to be resolved.

Despite these challenges cap and trade systems have great potential, especially for reducing CO_2 emissions. A number of countries and states including the European Union, Australia and California have already implemented emissions trading.

Special charges based on the 'the polluter pays principle'

An important means of creating economic incentives for resource efficiency and lowering emissions is the levying of charges. Charges are even more appropriate when the income raised is earmarked for remedial action in the context of the resource consumption or emission. Charges are effective when the damage is thoroughly manifested, the actor that caused it can be unambiguously identified, and measures for repair and prevention can be based on existing technologies and procedures. In other words, the polluter pays principle is most effective for end-of-pipe technical solutions.

Because of these conditions, the overall economic steering effect of charges may be limited. It could include user charges for waste collection, water or sewage treatment. If the government organises the investment through private businesses that have a record in cleaning up, or an interest in reducing future resource use and avoiding waste and emissions, it could become more effective. This would create a carrot-and-stick approach.

The downside is that charges are often difficult to implement and to police and are practically ineffective in cases where the burden of proof cannot be met and the polluter cannot be identified. Whilst in principle the notion of 'the polluter pays' is very useful, the applications and the overall economic effect are limited.

Ecological budget and tax reform

Ecological budget and tax reform (EBTR) is a very different economic policy. The primary objective of the EBTR is to stimulate economic subjects to such behaviour that leads to a reduction in environmental damage and its impacts on public health. In short, EBTR is the process of shifting the tax burden from employment, income and investment, to pollution, resource depletion and waste. Ecological budget and tax reform puts taxes on fossil fuels and nuclear energy, on strategic raw materials such as metals and industrial minerals with a focus on those materials which are likely to end up as toxic pollutants or hazardous waste and on the actual emissions and waste. At the same time, other taxes would be reduced making the budget and tax reform revenue neutral and therefore not increasing the overall fiscal burden for businesses.

Because of the revenue neutrality achieved by shifting taxes from income and labour to natural resources and emissions, one should not think about green taxes but ecological budget and tax reform. The steering effect of an EBTR is such that the cost of natural resources is increased and the cost of labour is reduced, which creates an incentive for investment in resource productivity. In other words, through the EBTR the input factor, 'natural resources', become more expensive and the input factor, 'labour', less expensive. If the principal of revenue neutrality is observed and the EBTR is introduced slowly over a couple of decades, quite high ecological taxes are possible and they may in fact attain a level of 5% to 10% of GDP (Weizsaecker & Jessinghaus 1992).

The higher costs of natural resources will justify business investment into green technologies and eco-efficiency of production. As prices are passed on through the whole economy, the EBTR will also lead to higher prices for consumers of such goods and services that rely on a large amount of primary inputs. Price increases for electricity and mobility will disproportionally affect low income consumers. In order to avoid such undesired effects the EBTR must be accompanied by compensation payments to low income households and disadvantaged groups. Compensation could be organised through the tax system or may involve direct payments for such households that don't pay tax at all. Another way of compensating lower income groups and small businesses, which have less potential to invest in resource efficiency, could be to reduce value added taxes.

The fact that ecological taxes could bring in as much as 5%–10% of GDP without damaging the economy as a whole, but with a large overall steering capacity for sustainable consumption and production, creates a compelling argument for an EBTR. On the other hand, introducing an EBTR would be a fundamental economic reform and would require large support in Parliament, from the business community and from society at large. Credible answers to a number of important questions need to be provided. These questions may include:

- What level of ecological taxation can be justified based on the polluter pays principle?
- Can the desired steering effect be achieved by raising the cost of natural resources and emissions?
- At which level of taxation can an optimal outcome for resource efficiency be expected?
- What would be the optimal timing for such a reform?
- Which other taxes should be lowered to achieve revenue neutrality?
- How can undesired distribution effects be avoided or compensated?

Answering these and other important questions in relation to the introduction of an EBTR requires national dialogue and political bipartisanship and would need to get all important players on board. It would unleash creativity, create a culture of innovation and reset the economic context to favour resource productivity and an economic system that relies less on natural resource use and emissions than our current economies.

Removing subsidies for large consumers of e.g. energy and electricity

For many decades, governments have subsidised the consumption of electricity, coal, water, and other natural resources. Aluminium smelters and other energy intensive industries have obtained major price concessions, making primary resources very cheap. This has created a disincentive for innovation in resource productivity and for lowering the emission intensity of production. Another example is agriculture, a sector that has long received large subsidies for energy and fertiliser use in many countries. In addition, many countries have provided generous subsidies or tax breaks to car commuters, creating a perverse incentive towards increased use of private cars and reducing the competitiveness of public transport. Whilst these subsidies may have created a short-term economic advantage, they are also very costly, slowing the pace of technological development and hampering innovation. These unhelpful subsidies should be removed in order to harmonise ecological and economic goals and enable sustainable consumption and production.

How will an EBTR profit developing countries in Asia and the Pacific

Very often, an EBTR is seen as a strategy for wealthy OECD countries, with little or no potential for developing countries in Asia-Pacific. There are a number of arguments for the early introduction of an EBTR in countries that have a large manufacturing base and show the emergence of a wealthy middle class, pursuing resource and emissions intensive lifestyles and consumption patterns. The Asia-Pacific region has become a net importer of many strategic natural resources including crude oil, metal ores and industrial minerals and it will be confronted with increasing costs for sourcing these imports. An EBTR in the OECD and in a number of Asian developing countries could reduce global natural resource demand and ease the pressure on resource prices thereby making

them more affordable with positive effects on the balance of trade for Asian developing economies. Secondly, investment in the region could be directed towards innovation in sustainable consumption and production, especially with regard to urban infrastructure such as public transport and energy and water efficient housing, allowing for much reduced energy demands for heating, cooling and transport. Such investments in a 'green economy' would have lasting effects for many years to come. Economic incentives to steer investment away from the old industrial model towards a green economy would assist in achieving human wellbeing at much lower environmental costs, with positive effects on employment and efficiency.

A triple dividend of ecological budget and tax reform

It is generally accepted among economists that when the consumption or production of a good or service results in a negative external effect, i.e. one that is not reflected in the price of the good or service, then social welfare can be improved by imposing a tax on the good or service (Ekins 2000). Similarly, where there is an environmental externality such as greenhouse gas emissions or the consumption of primary natural resources then the imposition of a tax, set at the right level, will lead to an environmental dividend. If there are possibilities for abatement of the externality at a cost lower than the tax levied, some abatement will take place. This will change the output/externality relationship and the output may grow while the environmental dividend, e.g. lower emissions and resource extraction, will also occur.

If the revenues of the environmental tax are used to reduce a tax on labour or to subsidise wages in a part of the labour market where wages are inflexible, this may lead to a rise in employment, i.e. an employment dividend which will also enable increased output. Employment dividends also arise through a shift to labour intensive production and consumption, enabled by the reduced price of labour relative to the taxed environmental inputs.

There is a good likelihood that an efficiency dividend will arise from using environmental tax revenues to reduce other distortionary taxes, but there is also the possibility that environmental taxes may exacerbate rather than alleviate existing tax distortions. This would indicate that optimal environmental tax rates would be below levels suggested by the environmental dividend alone.

Box 11:1 Common objections to ecological budget and tax reform

Despite the evident advantages of an Ecological Budget and Tax Reform (EBTR) there are a number of common objections against this policy instrument. The most common criticism is that ecological taxes, if they were effective, would destroy the very basis of their revenue yield. An effective EBTR would reduce natural resource use and emissions and hence reduced use would lead to a lower tax income. Natural resource prices would decline because of lower overall demand and the steering effect would be reduced. Hence green taxes are either unacceptable for the finance or for the environment department. This challenge can be addressed by introducing a yearly increase of the ecological tax while other taxes would be reduced by the same amount to achieve revenue neutrality. Thereby, revenues for the ecological tax would continue to grow and the steering effect would also grow accordingly.

Another common objection from social policy is that the EBTR would increase inequality because indirect taxes would favour high-income groups and disadvantage lower income earners who have to spend a larger share of their household budget on basic consumer items. Lower income groups could be compensated by a reduced value added tax or by direct compensation payments.

The main argument spearheaded by economist Lawrence Goulder (1995), however, has been that there is no double divided of reduced costs and environmental protection through an ecological tax reform. Goulder and colleagues argued that a positive second dividend only exists if the excess burden of the total tax system – including the excess burden of the environmental tax – declines. For instance, Bovenberg and de Mooij (1994) have argued 'that environmental taxes typically exacerbate, rather than alleviate, pre-existing distortions – even if revenues are employed to cut pre-existing distortionary taxes'. Increasing a narrow-based green tax and reducing a broad-based tax like a tax on labour income will typically increase the overall distortion of the tax system. Hence, they say that the second dividend is negative and the double dividend hypothesis fails.

The argument put forward by Goulder has contributed to stagnation in interest in ecological taxes. It is important to note that the argument of Goulder has been highly theoretical disregarding the contextual factors that would make an EBTR work. Firstly, even if were true that there is no second dividend the positive steering effect of pricing of externalities would still occur and would be highly beneficial in itself. Secondly, there is a need for practical experience with EBTR and similar approaches that would be beneficial for deciding on the additional measures that would come with an EBTR. In the first round of the European (Emission Trading Scheme) ETS the ability of auctioning was very limited with a minimum of 95% grandfathering. This has since changed with a much more flexible system allowing, for auctioning to a much greater extent. It certainly needs those practical experiences to further improve such market based measures such as an EBTR or an ETS.

Experience across the region

The Australian Carbon Tax

At the centre of the Australian Government's policy on climate change is carbon pricing, i.e. a carbon tax. Major polluters will pay per ton of carbon they release into the atmosphere. The cost has initially been set at $23 per ton of carbon and will increase gradually until 2015, when Australia will shift to a trading scheme that will let the market set the cost. This is widely thought of as the most effective and least costly mechanism to reduce carbon output and slow the pace at which climate change is occurring.

Under the new carbon tax, purchases of goods and services that rely on carbon-intensive materials or manufacturing processes will include the cost incurred by the environment, i.e. the amount of carbon pollution involved in producing a product will start to be factored into its final price. Goods and services with high associated carbon emissions will become more expensive, thereby increasing the competitiveness of other products manufactured in cleaner processes. The Australian scheme includes numerous exemptions for the steel industry, for transport fuels and for agriculture. Households are compensated generously for anticipated cost increases for electricity and consumer goods. The Australian Government also plans to link the Australian emissions trading scheme to the European scheme. The carbon tax does not include plans for reducing other taxes such as income or company taxes. Instead, the revenue raised directly compensates households and businesses, thereby decreasing the overall steering effect of the tax (DCCEE, 2012).

Trialling emissions trading in seven economic regions in China

Inspired by emissions trading to provide emissions reduction incentives in the most affordable way for businesses in Europe, the Chinese government is trialling a market-based approach to reduce carbon emissions. Seven regions have been chosen to implement pilot projects: Guangdong, Hubei, Beijing, Tianjin, Shanghai, Chongqing and Shenzhen. These regions represent different socio-economic conditions, which will inform the trial. The energy efficiency and carbon emissions intensity targets to be achieved by 2015 are ambitious and lie a little below 15% reductions. The Chinese Government plans a project-based voluntary emissions trading scheme (ETS) starting in 2012, moving to a mandatory ETS in 2013, an inter-provincial ETS in 2014 and a nationwide ETS in 2015 as part of the 13th Five-year development plan. The specific design of the ETS remains unclear (Belevrat, 2011).

Further reading 11

Environmental tax reform: does it work? A survey of the empirical evidence reviews the practical experience and available modelling studies on environmental tax reform. It concludes that when environmental tax revenues are used to reduce payroll taxes, and if wage-price inflation is prevented, significant reductions in pollution, small gains in employment and marginal gains or losses in production are likely in the short to medium term, while investments fall back and prices increase. Results are less certain in the long term. They might be more positive if models selected welfare instead of production indicators for the second dividend, and if several important variables, such as wage rigidities and the feedback of environmental quality on production, were factored into simulations.

Bosquet B 2000, *Environmental tax reform: does it work? A survey of the empirical evidence*, Ecological Economics Vol. 34(1): 19–32.

12 Redefining Education for SCP

Key Learning Points

- Challenges of knowledge development and learning towards SCP.
- What knowledge and learning competencies are required to fulfil the SCP challenge?
- Programmes and processes already exist in Asia-Pacific that are helpful in initiating required learning processes.
- Policy measures provide an opportunity for upscaling and mainstreaming necessary educational initiatives.

The role of education in the transition to SCP

This section has been written with the intention not only to highlight the well-understood role of education in facilitating development of SCP systems but, most importantly, to argue for redefining the whole notion of education as that of going beyond designated processes (e.g. training activities and educational programmes) and places (classroom and out of class areas where learning explicitly takes place) and applies to the processes where new actions for reducing social, environmental and economical vulnerability are being developed and tried. Ultimately, it demonstrates that the challenge of learning goes beyond the domain of formal educational systems and programmes, touching all aspects of life, all sectors and every region.

Challenges of SCP Education

The importance of consumption and production patterns for influencing the state of the environment and livelihood has long been recognised (Agenda 21). A number of policy documents and reports dealing with the issue at the national and international levels *emphasised the importance of education for de-coupling material consumption and growth, generating livelihood opportunities and encouraging more sustainable lifestyles.* With such universal recognition of the role of education, there are however, some challenges related to putting various learning processes in place. Such challenges, that are not exclusive attributes of the educational domain, relate to the changing role of knowledge in the society in general and most importantly, to aspirations to move towards more sustainable economies (see Box 12:1). Development of successful educational responses would require transformation of the educational system itself making it more attuned to the societal challenges, equipped with the skills for often very different learning strategies and continuously engaged with the critical SCP stakeholders.

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Box 12:1 Challenges of learning

Understanding the impact of education has long been the major challenge for giving it adequate place among planned interventions. When education is not directly concerned with development of easily defined skills (e.g. creativity, ability to deal with rapid change or engage with others required for SCP systems), manifestations of learning impacts - both in terms of time and space - are difficult to capture. Today, the dominant research on the effect of the educational systems and approaches related to sustainable development clearly favour impact on the individuals (as opposite to organisations and communities) and formal education (as opposite to non-formal and informal learning).

Another challenge comes from the features of today's reality. In the modern world characterised by accelerated changes, lack of predictability and, multiple economic, financial and environmental crisis, different forms of knowledge and learning become a necessity. Even sectors that for a long time adhered to traditional ways of doing things, find themselves in need to adapt to the constant demand for (at least partial) transformation. With often dramatic modifications of the market, political, social and production systems, the task of knowing and learning present an ever growing part of every-day life.

The notion of sustainable development (and linked to it understanding of the frameworks for SCP systems) is changing, which leads to the changes in development directions. If consumption-production systems are to support resilient communities, they have to be designed in a manner that allows constant innovation and adaptation, with difficult compromises and mistakes allowed to be made.

In developing SCP systems, the major SCP stakeholders, including policy makers, are facing the challenge of reacting to the inflow of seemingly endless new knowledge. As a result, there is a need for constant identification of ongoing knowledge processes, understanding ways of productive engagement with various "knowledge holders", testing and evaluating impacts of resulting innovations. This presents demands for new competencies and for educational systems that facilitate such competencies.

Development of competencies for SCP calls for practices and, ultimately a system, which overcomes compartmentalisation of responsibilities. Lack of coordination between national policies often results in situations where, for example, green actions are not complemented by skills development response and as a result, do not reach their potential (ILO 2011). On the other hand, lack of enforcement of SCP related policies, such as environmental legislation, precludes demand for green jobs or leaves qualified graduates unemployed (ibid.).

In search of competencies for SCP systems – what learning we seek

Working with the challenges resulting from the current consumption and production while leading development of the new SCP systems, would need to be guided by *competencies related to values, attitudes, knowledge, skills to apply such knowledge* and *ability to engage in required partnerships.*

Critically so, complexity of the SCP area would require broadening learning orientation, first, from understanding of the problem, analysing it, to identification of solution *(linking rhetoric and practice)* and, further, from focusing on the proposed solution to understanding of the consequences of such an intervention *(broadening the scope of the system)*. While this is absolutely critical for some areas, such as policy making and strategic development, it remains relevant for any field of work.

12:1 Steps for broadening the learning orientation

As a result, critical prerequisites of learning include the abilities to *systematically examine* real life situations, relating them to *strategic actions* while *engaging transdicsiplinary knowledge* and keeping *long-term perspective.* These required characteristics, that in their most systematic form could be attributed to the education for sustainable development (ESD), have important implications. They point out

- That learning for SCP takes place in a variety of ways made up of formal educational(engaging schools, higher education institutions, educational authorities at the regional and national level, communities) and outside (youth and women groups, civil society and faith organisations, museums, media, business enterprises, agricultural extension authorities, and others).

- That any partner involved at any stage of the life cycle, along the supply chain, in the local communities, among regulators would have to develop competencies that go far beyond technical knowledge of the field.
- That any professional or member of the community who aspires to contribute, through personal or professional actions, into shaping of the SCP systems would often need to become a non-formal educator themselves, therefore needs to be attentive to the competencies required for such a role.

Box 12:2 DESD and ESD

Following discussions and agreements during the Johannesburg Summit, the United Nations General Assembly, at its 58th Session adopted a resolution to start the Decade of Education for Sustainable Development (DESD) (2005-2014). UNESCO was designated to be the lead agency to promote and facilitate the Decade. The DESD aims at encouraging governments to include ESD into their educational systems, strategies and development plans.
ESD goes beyond a single subject of discipline. It is, "in its broadest sense, education for social transformation with the goal of creating more sustainable societies. ESD touches every aspect of education including planning, policy development, programme implementation, finance, curricula, teaching, learning, assessment, administration. ESD aims to provide a coherent interaction between education, public awareness, and training with a view to creating a more sustainable future" (UNESCO, 2012).

Education and learning in the critical areas of production and consumption

Many areas of SCP, often overlapping, indicate challenges from the perspective of knowledge development. The following section is by no means exhaustive, but addresses some of the key challenges in the critical areas of sustainable livelihoods, consumption, production and market change.

Encouraging livelihood opportunities

Development of sustainable livelihoods is concerned with questions related to participation of individuals and communities in productive activities within and outside formal markets. Sustainable livelihood is about the capability to earn income that is sufficient for maintaining (or increasing) quality of life and reducing vulnerabilities. As such, it cuts across issues of consumption and production, private goods and commons and different forms of capital. Education and innovation are necessary for developing an understanding - by individuals and the communities - about assets available to them, familiarity with livelihood strategies, risks associated with each strategy and skills necessary for undertaking productive practices. From the perspective of policy makers, ongoing learning would be required for identification of the critical factors that either facilitate (e.g. policy frameworks that encourage livelihood practices that secure ecosystem services and wellbeing of communities) or impede desired livelihood strategies (e.g. corruption, policies disregarding interests of currently disenfranchised).

Aspirations to develop new understandings, skills and attitudes for the transition towards greener, more sustainable markets, will contribute to developing a better quality of life for traditionally low-skill workers. By breaking the cycle of low skill jobs and poor income for workers, the livelihood choices of those who develop these skills would increase.

Box 12:3 Examples of learning practices to secure sustainable livelihood

The Tharu tribes of Dudhwa forests in **India** have traditionally relied on forest resources for their livelihood. As a result of 1977 decoration designating the forests where they lived as a National Park, the community has been left with limited options for survival. Centre for Environmental Education (CEE) office based in **Lucknow** as along with their partners from the formal and informal educational sector have initiated learning and development projects within the Tharu community, aimed at formulating a new natural resource management (NRM) plan. Within this plan new livelihood options as well as new institutional mechanisms for engagement of different stakeholders are explored. Capacity development and co-engaged learning have become the key strategy for implementation. Skill training for women entrepreneurs and integrated and sustainable farming practices had had been preceded by a range of learning activities (e.g. collective learning about how communities depend on the ecosystems, self-assessment of input-output into agricultural practices of Tharu, etc) as well as follow up actions (developing new decision making structures for the communities, links with decision makers, etc.).

Project CARE (Creating Awareness, skills, and Responsibility towards Environment) targets problems of waste in **Delhi** and beyond. The initiative of TERI university, young professionals from Accenture, college students and NGOs, engages women living in slums of Delhi in collaborative learning and skills development for utilising waste as a resource for developing marketable products. The focus of activities goes beyond the production skills and covers critical areas of interconnection of quality of life and the environment as well as knowledge about waste as a resource for various activities.

Training of trainers by the National Cleaner Production Centre (NCPC) in **Viet Nam** has, as its ultimate goal, improvement (through cleaner production measures) in the livelihood opportunities of the small producers in the handicraft industry. The programme addresses the issue of quality of the handicraft product as well as more efficient resource utilisation (e.g. innovative ways of using previously wasted material in differently designed products).

A multi stakeholder initiative for developing skills of the local community living in the last remaining forest on Cebu (**Philippines)** brought together partners from University of the Philippines Cebu and the local community. The Regional Center of Expertise (RCE) Cebu, in collaboration with stakeholders including community residents, local government units/agencies, civil society, businesses and media initiated assessing local natural resource endowment and poverty, raising awareness, and providing training on income generation through sustainable use of non-timber forest products, and pursuing options for improving the environment and livelihoods. Income generating activities have been promoted to develop skills of squatters and villagers to produce honey, brooms, furniture, herbs and medicinal plants, seedlings, cut flowers and organic fertiliser. A sustainability information centre was created at a local school, a map inventory on livelihood, natural resources, biodiversity and poverty developed, stakeholders' network centred around RCE Cebu was strengthened, public awareness and collaboration were promoted and sustainable livelihoods enabled.

Often, the call for more sustainable production and therefore educational processes to facilitate it, come from the increasing pressure on resources supporting livelihood practices. Resulting emigration or immigration demands total/partial restructuring of occupations and ways of production. For example, loss of soil fertility in some areas could cause influx of labour from these areas to others, potentially with sensitive ecosystems. Increasing population, particularly in rural and remote areas, would call for provision of services based on traditional practices or modern more sustainable practices.

Education for sustainable consumption

Linking knowledge with change practice

For sustainability-aware consumers (a result of formal and/or informal education) to become a part of the SCP system, information provision alone is not enough. Learning that leads to change would have to shift the focus from knowing the problem, to understanding the processes that need to be changed, and ultimately be connected to the processes of change practices.

In other words, the consumers would have to know ***how to put knowledge into practice.*** This might include engagement with partners who may not yet be interested or capable to quickly offer a solution to the challenges of private or organisational consumption.

In the absence of dominant SCP practices inside or outside markets, the consumers and citizens would need to learn how to contribute into existing good practices or to co-invent the new SCP systems together with other actors. To act responsibly consumers and other critical stakeholders require competencies that enable them to understand various positions and perspectives, figure critical factors that affect alternative directions of development, be able to evaluate the results and undertake further steps on the basis of such assessment.

Generally, engagement of multiple stakeholders also in search of more sustainable lifestyle options is important, as change practices by individual actors might encounter resistance stemming from traditional/cultural practices in the society. Collective learning grounded in local heritage, scientific information and analysis of different options might, as it has been shown by the example of RCE Tongyong (Box 12:4), be successful.

Box 12:4 Working across sectors

Food wastage is a large problem in The Republic of Korea. Regional Centres of Expertise on ESD (RCE) Tongyeong, brought together several partners under the "Clean Plate Movement". The Movement begun in schools, universities and later included other organisations outside of the educational sector. It brings together knowledge about waste and energy systems, green consumption, food security, farming practices and international food markets along with practices for avoiding food waste.

Deeper engagement - looking for alternatives

Sustainable consumption is a topic relevant for individuals, public and private sector. That is hardly surprising as new, more environmentally and socially benign consumption requires an understanding of available alternatives and their impact along the supply chain as well as the ways how the consumption system could evolve. Assuming that the organisational decision to consume sustainably has to be logically complemented by educational activities, let us touch the most challenging aspects of consumer education – learning in the broader society and across the sectors.

Forming conditions for sustainable lifestyles presents serious challenge as long-term changes in behaviour may be difficult to achieve by short term interventions. Such interventions, in the form of campaigns (e.g. engaging celebrities or opinion leaders), could contribute to *drawing attention to the problems.* However, accepting responsibilities and most importantly, linking them to actions aimed at the local and global objectives requires a set of policies that *provide structure and incentives* for securing more sustainable lifestyles. It also requires different sets of educational measures that are rooted in the local socio-cultural contexts and engage learners more fully as researchers (LOLA project of PERL initiative) or co-developers of practices.

Box 12:5 Consumption - looking for likely alternatives

Launched in 2005, the Looking for Likely Alternatives (LOLA) project of the Consumer Citizenship Network is a tool for discovering new sustainable solutions for lifestyle choices in the local communities. The learners and the teachers who are being assisted with the materials for identifying, describing and presenting cases, give visibility to new models of SCP. They further discuss the identified examples with families, neighbours and friends and by doing so initiate broader social learning.

Consumption and livelihood

When looking at the notion of sustainable consumption in the Asia-Pacific region, one ought to look at the meaning that is associated with it. It is critical that in addition to the focus on the environmental dimension, consumers (private and organisational) are able to favour the notion of justice and quality of life for all. It is also important to encourage learning about consumption that is not limited to those who can afford it – many educational processes today, especially those unfolding around green technologies or premium green products, might not be accessible for the less economically privileged. Supporting practices that are accessible for all, while increasing quality of life and livelihood opportunities along the supply chain, would need to become a priority of learning programmes. While some interesting examples of such practices emerge in various corners of the region (see Box 12:6) there is still a need for more systematic actions engaging economically or socially underprivileged communities as part of the supply chain.

Box 12:6 Consumption and livelihood

In approaches developed to encourage participation of the economically poor in the markets (Hart 2005) the economically poor are being perceived as potential entrepreneurs and consumers. Their inclusion in the supply chain (that, considering their enormous number could be economically beneficial) requires the development new business models that not only deal with the questions of what kind of a product or service would become a priority for the poor, but also how to satisfy their consumption needs while facilitating their livelihood options. Numerous regional examples exist of corporations that engaged with the poor in providing essential products and services accompanied by learning and training for the companies own staff and the poor. This iis the experience of Holcim Lanka – the leading Sri Lanka's provider of cement – that set up to provide housing for the country poor. The initiative engaging the manufacturer, Grameen Bank, National Building Research Organization and the poor families required a high degree of informal collaborative learning as well as training, including training local people in supervised self-construction.

Education for sustainable production

Ambitions for more sustainable production practices aspirations for greener and more sustainable industries call for development of professional and generic skills. Institutionally, transition to more sustainable economies often means a decrease (with potential disappearance) of some industries, "evolutionary" improvements of production practices and product design in other sectors, emergence of new, greener, industries and productive activities that evolve outside of traditional markets.

From the educational and learning perspective it means great changes in the ways education and scholarship are conducted, including:

- New skills that would be required by the new market preferences (see next section).
- New forms of education for the industry employees including more sustainability-oriented technical and vocational education and training (TVET, Box:12:7) as well as ongoing training within the companies.
- New forms of learning across the supply chain with attention given to the empowerment of the suppliers and customers rather than more traditional compliance inspections.
- New forms of cross-sectoral co-engaged learning at the level of local communities – across public-private or inside public domains.
- New forms of scholarship that, while cutting across disciplines, keep in focus practical engagement of change.

Box 12:7 Technical and vocational education and training (TVET)

TVET plays a very significant role in educating the work force in Asia. It is responsible for 80% of occupations in China. A transition to more sustainable production consumption systems would call for new professionals. More sustainable TVET, also seen as a strategy to bring more dignity to the technical and vocational jobs, would have to address ethical and sustainability goals associated with each occupational specialisation. The curricula, methods of delivery and required competencies for the graduates would need to evolve. Such development itself has to be a collaborative mission of stakeholders from, among others, TVET institutions, government, relevant productive sectors and higher education.

For example, the government of Australia issued a National Vocational Education and Training Sector Sustainability Policy and Action Plan (2009-2012) offering a framework that aligns existing initiatives, supports development of the new ones and "seeks to build the capacity of the VET sector in order to facilitate innovation and technology diffusion through proactive management, relevant training product development, responsive training delivery, and quality student support activities". It covers a range of measures that not only deal with the curricula development but also with capacity of educators to deliver specialised professional and generic skills for sustainability and with requirements for the training organisations.

Education for the transition towards more sustainable markets

Greener and more sustainable products and services would require availability of new skills for their production and maintenance. For example, demand to develop low-carbon technologies, would open business opportunities where knowledge of cleaner production and innovativeness for developing new business models would be high on the agenda. Presence of new greener technologies and more sustainable services require specialists that might not yet exist or who do not possess all required skills. For example, as the largest employer in the world (UNEP 2008) agriculture will face a need for educating farmers and other related occupations in using low-carbon technologies and new ecosystem friendly methods. Requirements for low-carbon vehicles will call for skills to develop, produce and service the machines. Responsible building practices call for simultaneous application of skills from different fields to design, build and service buildings and infrastructures that are energy-efficient and resilient. The energy sector will demand specialists who are able to create, install and support various efficient equipment and electricity systems. In addition to the need to educate new specialists, the SCP systems would need to address the information, behavioural, regulatory, technical and financial barriers to redirect capital flows from traditional high-carbon to low-carbon investments projects.

While educational programmes oriented towards more SCP systems could be undertaken by a variety of partners, it is critical to understand the requirements for the various skills for the short and long-term development. However, policies that address sustainability-related goals and skills development often are not coordinated. Such integration has begun with some notable examples such as the Green New Deal of the Republic of Korea that aligns aspirations for green growth and development of the green technologies with the goals for green skills (with the first step dedicated to the research on the required skills). Another example can be found in Australia where they align several national programmes and policies for giving strategic direction, knowledge dissemination and funding. Among them are the Action Plan for Education for Sustainability, National vocational Education and Training Sector Sustainability Policy and Action Plan (2009-2012), Education for Sustainability Grants Programme, Australian Sustainable Schools initiative, National Education for Sustainability network Initiative, etc (ILO, 2011).

Box 12:8 Skills development for greener markets

In an attempt to develop education for sustainable development in Cambodia, partners representing academia, non-governmental organisations, governmental agencies, research institutions, schools and local community organisations have established a Regional Centre of Expertise on Education for Sustainable Development (RCE) Phnom Penh. The RCE focuses most of their collaborative projects on development of sustainable agriculture focusing simultaneously on the school education and education of the farmers. In addition to developing specific skills for organic agriculture, such as producing and applying compost, pellet compost, liquid bio-fertilizer and bio-pesticide, the partnerships focus on developing farmers' confidence and their exposure to the ongoing innovations in the field.

New governance challenges – education for policy makers

Individual areas of SCP that call for interventions, with learning and new knowledge playing a critical role, is a part of much larger challenge of SCP governance. In the domain of SCP, it could manifest itself through solutions that go beyond individual sectors and "traditional" stakeholders. It would have to overcome the situation where, for example, product design remains largely the responsibility of the producers with consumers playing a passive role or where the more conventional forms of businesses overshadows opportunities offered by more sustainable production activities that don't have the scale or access to resources and markets.

To enhance governance of the SCP system, education of a variety of partners needs to focus on the capabilities to look at the broader slice of a SCP system than traditionally practiced within the professional sectors. For example, effective and sustainable capacity building needs to cut across all segments of education and life-long learning, - including educational curricula for formal educational column, vocational education, leadership programmes, data collection and analysis processes, research and innovation programmes, community outreach and grassroots training.

In order for an effective coordinated response to emerge, a partnership of formal and non-formal education, researchers, policy makers and civil society have to emerge at the national and sub-national levels. Models of such practices are gradually emerging. For example, a major programme within the UNU's DESD initiatives is the Regional Centres of Expertise (RCE) network and PRoSPER.Net (the Promotion of Sustainability in Postgraduate Education and Research Network). These contribute to the formation of a global learning space for sustainable development, including sustainable consumption and production issues, and the transformation of knowledge and learning towards sustainable development.

Box 12:9 UNU's ESD multi-stakeholder initiatives

Regional Centre of Expertise (RCE) is a network of existing formal and nonformal education organisations mobilised to deliver ESD in the region or locality where it is situated. It creates a platform for dialogue among regional/local ESD stakeholders and for exchanging information, experience and good practices on ESD. In September 2012, there are 101 RCEs worldwide, 41 are located in Asia-Pacific. RCEs engage in capacity building through education and training in several SD issues including SCP.

Twenty eight reputed higher education institutions of ProSPER.Net in Asia-Pacific (Promotion of Sustainability in Postgraduate Education and Research Network) worki together to integrate SD into postgraduate courses and curricula as well as in research programs. The network has developed learning modules for various professionals, re-orientation of business schools curricula, e-learning programme for public policy and alternative approaches for university appraisal based on sustainability principles. One of the ProSPER.Net Programmes, coordinated by TERI University, focuses at giving on-line education for the policy makers interested in SCP and climate change.

Facing the main challenges of the transition towards more a sustainable economy, calls for new leaders that are able to facilitate required transformation. Important examples of educating such leaders are available in the region. For example, the Ministry of the Environment of Japan is facilitating Environmental Leadership Initiatives for Asian Sustainability (ELIAS), focussed on the development of environmentally-conscious citizens and environmental leaders. The initiative, lead by universities, is built on facilitating three characteristics of a leader (at the level of ordinary citizens or a high level decision maker) - commitment, expertise, and leadership.

Internationally, we observe emergence of other important programmes that are focused specifically on the policy and decision makers in the national and sub-national governments.

Box 12:10 Examples of Asian leadership programmes focused on SCP

Conducted in collaboration between UNU-IAS, the ASEAN Secretariat, the host Environment Ministries, and other UN agencies and international organisations, ASEAN- Plus Three Leadership Programme on Sustainable Production and Consumption, has been run annually since 2008. The aim is to contribute to debates on green economy, which seeks to improve human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. The programme intends to provide government policy makers, as well as business leaders with relevant knowledge and skills for policy making, and to facilitate change or potential change processes that may be developed in the course of the programme. The programme focuses on change management, in the context of sustainable production and consumption. From 2012, the programme intends, with support of the main partners – UNU-IAS, UNEP, UNIDO and ASEAN secretariat to assist the participant in developing country-specific SCP programmes.

The Asia-Pacific Leadership Programme on Environment for Sustainable Development was jointly organised by UNEP and the Tongji University's, UNEP-Tongji Institute of Environment for Sustainable Development (IESD). The Programme aspires to provide training for the young and emerging leaders in governmental organisations, NGOs and private enterprises in the Asia-Pacific Region, to improve thinking and decision-making abilities, to balance environment and sustainable development and to set up a platform for further learning and interaction. The Programme, offered annually since 2004, draws resource persons from the UNEP Asia-Pacific Regional University Consortium comprising of leading universities in the region. UNU-IAS is a collaborating UN agency. The programme addresses the human, environmental, social and economic dimensions of sustainability in a holistic fashion.

Policy options for education and learning for SCP systems

The transition towards more sustainable economies reliant on different production and consumption systems will require massive responses at the level of industries, government, public-private alliances and multi-stakeholder partnerships. It will eventually demand radical transformation of educational and training systems.

With such realisation, education for the policy-makers and regulators becomes a primary task. As governments play a critical role in changing existing consumption and production systems, both through legislative provisions and incentives, it is essential that new competencies are developed on the side of the policy and decision makers. The programmes of *capacity development for the governmental officers and policy makers would need to enable them to identify, create or further develop different policy packages/options and assess them from the perspective of environmental, social and economic impacts in a particular context.* Part of such assessment would *need to relate desired development directions to the required skills and other competencies* necessary to achieve it.

Generally, *SCP-related policy measures would have to be coordinated and aligned with measures for development of competencies that would secure implementation of these policies.*

Education, awareness raising and information provision with respect to SCP are important for informed choices by citizens and organisations. Still, they do not guarantee shift in behaviour or emergence of new SCP systems.

Educational initiatives that promote drive towards more SCP, with some of them referred to in this section, highlight the necessity for new and different education for all segments of the society and sectors of industry. They demonstrate that *development of merely technical skills for existing or for newly emerging jobs are not sufficient.* There is also a need for developing *additional competencies such as understanding of links between personal/professional activities and environment, ability to innovate and engage with other partners* as well as for measures that promote and foster application of the required competencies. Educational approaches promoted by ESD could provide valuable and practical insights into ways of structuring educational processes for SCP.

It is recognised that while the pedagogies for cultivating sustainability competencies are being gradually developed by formal education, it remains a challenge within non-formal, informal and TVET learning. Teaching innovations and teaching competencies for teaching leadership, networking, communication, innovation, complexity of decision making, negotiation and risk management are fundamental for the success of SCP strategies. If education of teachers and trainers (also with the goal of increasing their number) is not addressed, it could become the major impediment for desired development.

SCP system development is a complex task that would need to be addressed at the level of policy development, changes in production and consumption patterns, business models and technological solutions. It is critical that regardless of the challenge the policies address, *the measures that focus on capacity development through learning, address key engaged partners.* The main responsibility for developing such capacities would have to be decided dependent on the prevailing circumstances.

When recognising the need for education in the transition towards SCP, critical attention should be given to polices that enable educational programmes and processes targeted at partners with lesser financial or negotiating power such as local communities, small and medium size companies (SMEs), vulnerable and marginalised.

Finally, while engaging partners for whole education is a professional activity (schools and higher education, TVET system, professional training organisations, etc.), it is important to provide incentives to the organisations, programmes and networks that have an existing track record in engaging and learning across different sectors and segments of society nationally or internationally. Such organisations often consider learning as part of the innovation process developing new alternatives for SCP.

Further reading 12

Skills for Green Jobs: A Global View demonstrates the importance of skills for enabling more sustainable growth of the developed and developing countries. It demonstrates numerous examples of educational practices, policies that facilitate them as well as principles that guide such policies.

International Labour Organization, 2011, *Skills for Green Jobs: A Global View*, Report of the ILO prepared by Strietska-Ilina O, Hofmann C, Durán Haro M & Jeon S, Geneva.

Here and Now! Education for Sustainable Consumption: Recommendations and Guidelines is primarily intended for the policy makers. It delivers a case for education for sustainable consumption by linking it to other national goals including good citizenship and environmental protection. It shows how education could unlock the potential of sustainable development and provides guidance on integration of educational and sustainable development strategies.

United Nations Environment Programme 2010, *Here and Now! Education for Sustainable Consumption: Recommendations and Guidelines,* UNEP, Paris.

Towards more sustainable consumption and production systems and sustainable livelihoods: learning contributions of the RCE Network demonstrates how multi stakeholder cross sectoral partnerships could advance SCP practices through co-engaged learning and innovation. Drawing on the practices of the Regional Centres of Expertise for ESD from different world regions, including Asia, it highlights how a combination of cross-efforts from multiple stakeholders, including governments, contributes into to the areas lifestyle choices, green skills development through technical and vocational education and training (TVET), green industries, governance for a greener economy and sustainable livelihoods. It further explores the strategies for up-scaling and mainstreaming such initiatives.

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13 Energy Efficiency

Key Learning Points

- The important role of energy efficiency for the Asia-Pacific region.
- Economic, social and environmental benefits from energy efficiency.
- Drivers, barriers and policy options to achieve energy efficiency.
- Learning from the regional initiatives and experiences.
- The way forward to accelerate the energy efficiency momentum.

What is energy efficiency and why is it important?

Energy is widely recognised as the engine for economic growth and modern life. The way we live, construct, produce, eat and commute has a major bearing on energy, most of which is derived from coal, oil and natural gas. Fossil fuels are being consumed at a much faster rate than they can be replenished. If we continue to demand fossil fuels at 2006 rates, the reserves of oil, coal and gas will last a further 40, 200 and 70 years, respectively.

Under the business-as-usual scenario, the world energy demand is expected to increase from around 12 Gigatonnes (Gt) now to over 16 Gt by 2030. Most of this growth in energy demand will come from the Asia-Pacific region which is faced with increasing population, rising affluence and changing life style. One should not underestimate the dominating impact of Asia's fossil fuel use on the global climate. Between 1970 and 2005, the region's CO_2 emissions grew by 400%, rising from 13 to 30% of global emissions (Cribb, Schandl & Hosking 2011). The soaring energy demand combined with declining efficiency in its use, manifested in the form of increased energy intensity, further exacerbates the region's vulnerability to energy price while jeopardising global ecological sustainability. Business as usual is therefore no longer an option and we will face dire consequences if we fail to act with clarity of purpose and raise energy productivity radically.

Box 13:1 Energy intensity and Energy Efficiency

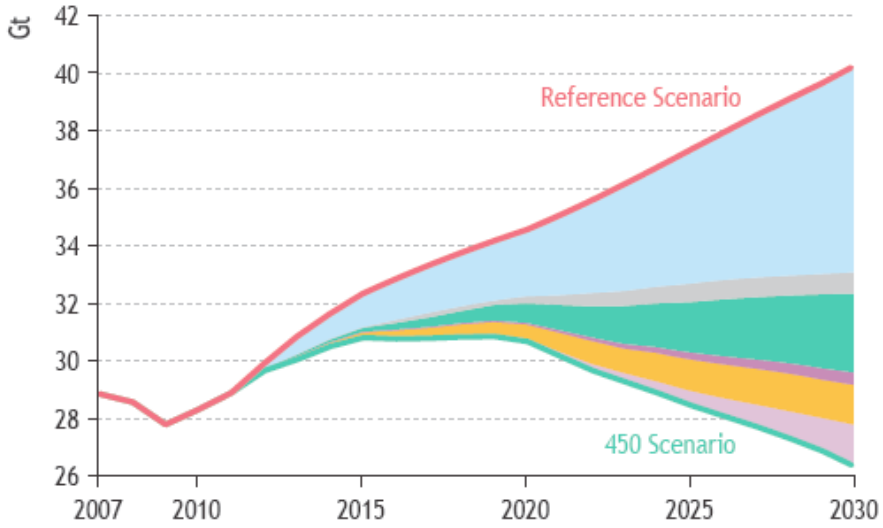
Energy Intensity is defined as the ratio of energy consumption per unit output or activity (e.g. toe/$ or MWh/Euro). On the other hand, Energy Efficiency improves when a given level of service is provided with reduced amounts of energy inputs or when services are enhanced for a given amount of energy input (e.g. kWh/m^2 of air conditioned space per annum or litres of gasoline/100 km travelled). An increase in energy efficiency would mean a decline in energy intensity. In reality, energy intensity includes not just energy efficiency but also some structural and behavioural components. For example, a decrease in energy consumption in a commercial building does not necessarily mean the building has become more energy efficient. Other factors such as changes in activities in the building (occupancy, operating hours), fuel switching, market demand for commercial space, or even the behaviour of the occupants can also affect energy intensity.

Industrialised nations went through three distinct phases of development—poverty alleviation, industrialisation and mass production and consumption. Asia is experiencing a simultaneous occurrence of all three phenomena. If adequate measures are not taken, it will have devastating consequences on the development of the whole region, in the form of rising energy prices, energy supply volatilities, unaffordable goods and services, stagnant or negative economic growth and degraded life style. There is an urgent need for a paradigm shift in energy consumption, as it will have far-reaching impacts on development, the balances in global resources and the global climate.

While the industrialised world was built with abundant and cheap oil and for a much smaller population, the Asia-Pacific countries face high and volatile energy prices as a major obstacle to growth for a burgeoning population, with a sizable number still deprived of access to modern energy services. Energy efficiency offers a great opportunity for innovation and lasting benefits through the reduction of energy use for a given service or level of activity by enhancing energy productivity, and squeezing the maximum out of every unit of primary energy (i.e. doing more with less). The notion of energy efficiency is often associated with adoption of best available technologies and practices (sustainable production, which requires innovation and legislation/obligation). It can also be achieved through better organisation or management and through behavioural changes (sustainable consumption, which requires raising awareness and incentives/ taxes).

According to the International Energy Agency (2009), it is possible to lower energy-related CO_2 emissions by 2030 to below the 2009 level, by various technological measures. Interestingly, energy efficiency alone has the potential to contribute a 57 per cent reduction in CO_2 emissions, and much of it at a fraction of the marginal cost of energy supply.

Figure 13:1 Possible ways to lower energy related CO2 emissions by 2030



	Abatement ($Mt CO_2$) 2020	2030
Efficiency	2 517	7 880
End-use	2 284	7 145
Power plants	233	735
Renewables	680	2 741
Biofuels	57	429
Nuclear	493	1 380
CCS	102	1 410

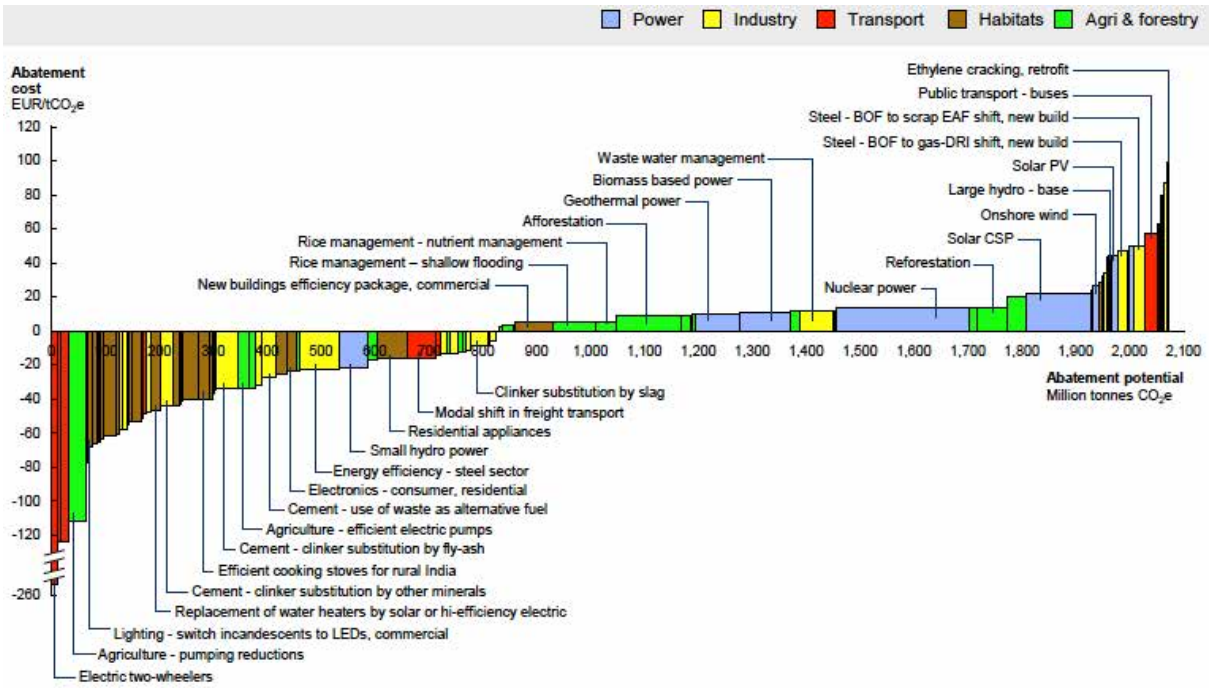
The CO_2 abatement curve developed by McKinsey (2009) for India shows that many energy efficiency measures can be attained at negative costs on the basis of life-cycle analysis. Such energy efficiency measures identified for India are also relevant for other developing countries in the Asia-Pacific region.

Box 13:2 Where do we stand in terms of energy productivity?

Here are a couple of examples of abysmal energy productivity in our day-to-day life and possible solutions to dramatically enhance energy productivity:

- Less than 1% of the energy in petrol or diesel moves us in an automobile. The vehicle's weight alone is responsible for two-thirds of the energy needed to move it. Vehicles can be designed to be more compact and aerodynamic, constructed with ultra-light but ultra-strong materials and equipped with more efficient engine technologies and drive-trains to achieve at least a factor-10 efficiency improvement.
- Less than 3% of the energy in fossil fuel keeps us comfortable in hot or cold climates while the remaining amount is lost in the form of heat losses or gains through poorly designed building shells. Buildings can be designed with the right materials, shape and orientation, minimising or avoiding altogether the need for traditional heating and cooling equipment.

Figure 13:2 India's abatement cost curve for 2030 (cost below EUR 100/tonne)



Energy efficiency can be considered as the keystone to achieve **sustainable consumption and production** at country level, or **eco-efficiency** at corporate level. Investment in energy efficiency is extremely attractive as the incremental capital investment is mostly recovered in a reasonable time frame, energy cost is lowered, and energy productivity improves, thus helping nations and businesses to be better prepared against sharp and unpredictable hikes in fossil fuel prices in future. Moreover, unlike fossil-based energy supply options, energy efficiency does not have adverse impacts on water supplies, coastal wetlands or coral reefs and does not result in spills, accidents, explosions or fires. Hence, there is need for concerted efforts to tap this "low hanging fruit".

Box 13:3 Negawatt and Factor-4 Efficiency

A negawatt is a unit in Watts of energy saved. For example, when a 20-Watt compact fluorescent lamp replaces a 100-Watt incandescent bulb without sacrificing the quality of lighting service rendered, it can be considered as an 80-negawatt power plant because 80 Watts are saved at the end-use by quadrupling the efficiency of the lighting device (also referred to as factor-4 efficiency). The power utility can use this saved electricity to satisfy another customer without the need for investment and the fuel to generate and transport electricity from the power plant to the customer. In fact, the fossil fuel savings are even greater if one considers that every Watt delivered to a customer requires roughly 4 Watts of fossil fuel due to the energy losses in the thermal power plant and the transmission and distribution network.

Just as the compact fluorescent lamp provides an opportunity to divide the electricity consumption by a factor of four without any compromise in the quality of service, there are similar opportunities for changes in the way we provide thermal comfort in homes and offices, manufacture products in factories, grow food in farms, or transport people and goods. Individual products/devices can improve energy efficiency significantly, but the most impressive savings come from optimising entire systems and processes.

Consider the vast need for energy to sustain the present trend of economic development in Asia. According to IEEJ (2010), energy demand in Asia and the Pacific is projected to increase by about 80% between 2005 and 2030, and only about 11.2% of this additional demand will be met by renewable energies. Meeting this future energy demand will require huge investments, in the order of $7 to 9.7 billion and involve inefficient conversion of depleting fuels into premium forms -- mainly electricity -- in ever larger, more complex, more centralised plants. If on the other hand, we started taking the "**soft energy path**" and joined the bandwagon of "**negawatt revolution**" that the eminent American Scientist Amory Lovins referred to as early as 1989, we could gradually squeeze out fossil fuels by a combination of energy efficiency and appropriate renewable energy sources.

The "Titanic" sank by hitting an iceberg due to the Captain's misjudgement. Investment decisions are very often made on the basis of the first-cost, which can be like the tip of the iceberg, hiding the operation and maintenance costs that are several-fold greater. For example, the annual cost of lighting an incandescent bulb

can be 30 times more than its initial cost, or the cost of a typical boiler can be equivalent to hardly 3-4 months of fuel cost to produce steam from it. Energy efficiency solutions may be modestly more expensive but on the basis of life-cycle analysis, the cost of saving energy is lower than the cost of subsidised fossil fuels.

Policy options, barriers and drivers to promote energy efficiency

Asian developing countries with per capita energy consumption below the world average need undoubtedly more energy to meet the rapidly growing demand for housing, industries, transport, and services and achieve the Millennium Development Goals (MDGs). However, this need not be at the cost of using energy inefficiently. A well-conceived energy efficiency strategy will allow them to achieve their developmental objectives with lower energy consumption and enable them to improve the living standard and quality of life. For countries that face the added challenge of achieving the target of production and services under energy supply constraints, the deficit in energy supply can be effectively met by minimising the "energy waste".

Box 13:4 Drivers for energy efficiency for the Asia-Pacific region

- **Energy security** - Reduce energy demand growth, improve energy supply reliability, and minimise dependence on energy import (maximise energy export in energy-surplus countries).
- **Economic competitiveness** - Reduce energy intensity, lower production cost to make the products more affordable to users, enhance energy productivity, and improve (domestic and export) competitiveness.
- **Health** - Reduce local (solid, liquid and gaseous) pollution and improve human health.
- **Climate change** - Abate the adverse impacts of energy use on the regional and global environment (emissions of greenhouse gases and acid rain).

Huge technological progresses have been made to improve the efficiency of energy consumption and production. In practice however, it can be challenging to tap and capture the most potential energy values from our fossil as well as renewable energy resources, in the overall process of their extraction/capturing, conversion, transportation and use. There are several barriers to making this transition. Governments, businesses and individuals can all play a role, but there is no easy way to coordinate their actions. Barriers to investing in energy efficiency include lack of information and awareness, inadequate knowledge, limited access to technology, market failures, lack of resources and limited capital, poor institutional structure and a lack of incentive mechanisms.

Box 13:5 Typical barriers to energy efficiency

1. **Information and awareness** - Lack of information on actual energy consumption and energy saving potentials, lack of knowledge of best practices and best available technologies
2. **Behavioural and organisational** - Behavioural characteristics of individuals and organisations that hinder the propagation of energy-efficient technologies and practices
3. **Technical** - Absence of affordable energy-efficient technologies suitable to the local context; inadequate capacity of energy users to identify, develop, implement energy efficiency projects
4. **Market** - Market structures and constraints that prevent energy users from appraising the true value of energy efficiency
5. **Financial** - High up-front costs of energy efficiency solutions and the low energy supply tariffs prevailing in many developing countries; lack of awareness of financial institutions of the financial benefits of energy efficiency investments, etc.
6. **Structural** - Structural characteristics of the political, economic, energy system which make energy efficiency investment difficult
7. **Institutional** - Weak institutions to support energy efficiency; institutional bias towards supply-side investments
8. **Regulatory** - No regulation to invest in cost-effective energy efficiency; subsidised energy supply

According to a recent IEA (2009) study covering 38 developing countries, fossil fuel consumption subsidies amounted to 409 billion USD in 2010, with subsidies to oil products representing almost half of the total. While governments argue that lower energy prices are beneficial for economic growth and can make the products and services more affordable, there are several perverse impacts of such short-sighted policies. Subsidies are irrational use of taxpayer money and government investment, more often benefitting the elites and upper classes than the poor in developing countries. Also, a low energy price is a deterrent to the adoption of energy-efficient equipment and processes, eroding the competitiveness of manufactured products and services.

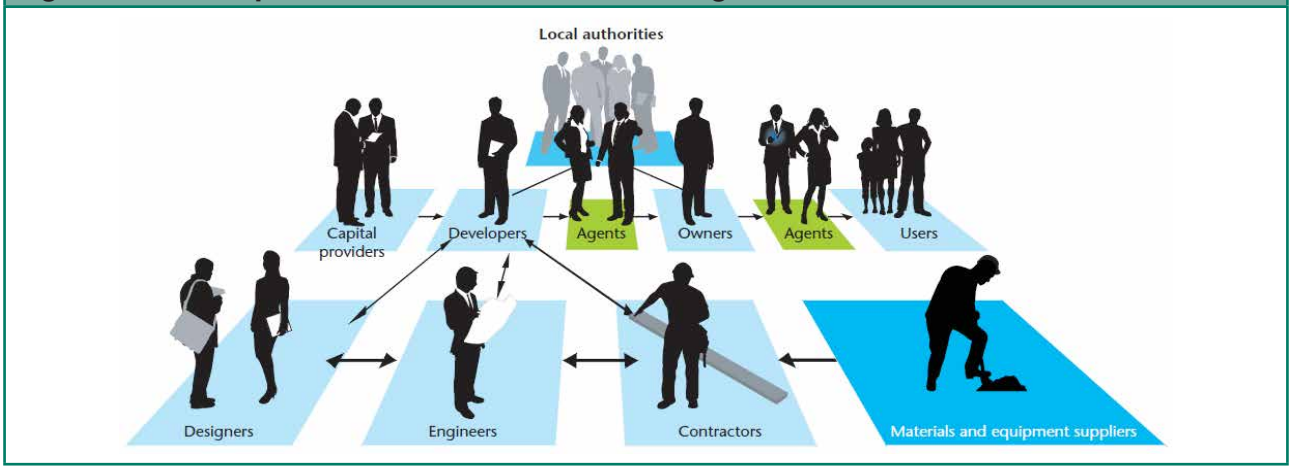
Government intervention is essential in the form of suitable policies and strategies that engage stakeholders and build consensus in order to overcome barriers to energy efficiency. Policies addressing the different barriers to energy efficiency are listed below:

Box 13:6 Policies addressing the barriers to energy efficiency

Barrier	Examples of policy options to overcome the barrier
Information and awareness	*Awareness raising:* public information/awareness campaigns through audio, visual and print media, information clearing house, pilot and demonstration programs, etc. *Benchmarking:* Support for creating and maintaining database for tracking the performance of different categories of energy users
Technical	*Training and certification:* Develop human capital and institutional capabilities in energy efficiency *Technical assistance:* Standard setting and code enforcement, energy auditing, data collection and analysis, energy management, integrated approach to energy system designing, financing options, etc. *Curriculum development:* Inclusion of energy efficiency in the standard curricula *Technology promotion:* Demonstration and dissemination of energy-efficient technologies with high energy savings and replication potential
Market	*Labelling and certification:* energy performance labelling, disclosure and benchmarking of appliances and systems, setting norms for Best Available Technologies (BATs) *Funding Research and Development (R&D):* Catalyse long-term research and technology innovation in partnership with researchers and market players *Public private partnership:* market transformation through performance-based public tendering and procurement *Energy Service Company (ESCO):* Assistance for the creation of ESCOs *Utility Demand Side Management:* Obligation on utilities to invest and support energy efficiency
Financial	*Reducing upfront costs:* Grants, subsidies, tax incentives for energy efficiency investments, lease-purchase agreement, etc. *Access to financing:* Loans, interest rate buy-down, energy performance contracts, third party financing, energy efficiency revolving fund, etc. *Non-fiscal incentive:* public recognition, dispensation from other codes, expedited permits, etc.
Institutional	*Awareness and capacity building:* Sensitise public decision makers of the need to create a good balance between supply expansion and demand management, capacity building to conceive, organise and support energy efficiency programs; study visits to provide exposure to best practices *Phasing out subsidies:* Internalisation of all costs in energy pricing
Regulatory	*Codes and standards:* Prescriptive or performance-based energy performance *Energy labelling and certification:* Making energy labelling and certification mandatory *Minimum energy performance standards (MEPs):* Phasing out most energy-inefficient products from the market *Energy audit and management:* Mandatory energy audits and adoption of energy management standards by energy intensive entities *Energy conservation reduction targets:* Obligations on high-impact energy consumers to reduce the energy intensity in a time-bound manner; energy saving obligation on energy supply companies *Investment obligation:* Obligation on certain categories of energy users to make energy efficiency investments

Many countries consider energy efficiency law and decrees as prerequisites as they provide statutory legitimacy and direction to energy efficiency policies by defining objectives as well as the policies, strategies and action plans for targeted economic sectors. However, results expected from such strategies and action plans are not likely to be achieved satisfactorily if there are no suitable institutional arrangements, funding, or coordination mechanisms in place for the effective implementation of the action plans. Institutional arrangements are particularly relevant in overcoming possible conflicts of interests and creating consensus among government departments and/or between public and private sector organisations. As energy efficiency concerns all in the society, government alone cannot succeed in implementing energy efficiency measures without active support from the various stakeholders: energy end-users, energy companies, technology and energy service providers, financial institutions, academic and research organisations and civil societies. Coordination allows extensive consultation with stakeholders and ensures transparency in the energy efficiency strategy development process. Moreover, all partners clearly understand their responsibilities and provide support for the successful implementation of programmes.

Figure 13:3 Example of stakeholders in the building sector



Source: (WBCSD 2009)

Developing countries generally tend to emphasise regulations more than the free-market approach, as they find it challenging to mobilise adequate funds to translate energy efficiency policies into action. However, a balance between market mechanisms (carrots) and regulations (sticks) is needed to ensure the effectiveness of national energy policy initiatives. A steady and reliable source of funding can finance the implementation of energy efficiency programmes. Governments can allocate budget for such activities by earmarking energy/environment taxes and public benefit charges that are exclusively used to fund energy efficiency programmes.

Experience across the region

Box 13:7 Encouraging livelihood opportunities

- **ASEAN** – ASEAN Energy Management Scheme (AEMAS) for training and human resource development of high-level executives
- **China** – Mandatory stipulation to use clean energy technologies and phase out programme for obsolete energy-intensive equipment
- **India** – Energy conservation standards and labelling requirements for industrial equipment and energy audits for energy intensive factories
- **Indonesia** – The Energy Conservation Clearinghouse for exchanging data and information on energy efficiency and conservation
- **Japan** – Economic incentives for the efficient use of energy and the development of clean energy technologies
- **Korea** – Mandatory submission of energy saving plans for buildings exceeding a certain size
- **Malaysia** - Demonstration projects aimed at creating awareness and disseminating information about the high performance of energy efficient buildings
- **Philippines** – Integration of energy efficiency concepts into the operation of government agencies to realise the reduction target of 10% in electricity and fuel consumption in public buildings
- **Singapore** - Accelerated tax depreciation allowance for energy efficiency equipment and technologies
- **Thailand** - Energy Credit and Revolving Fund to promote energy efficiency and alternative energy

The rapid growth of Energy Conservation/Efficiency Frameworks adopted or Acts/Laws promulgated by the countries in the Asia-Pacific region reflects their recognition of its critical role in sustainable development, by bridging the demand-supply gap, improving international economic competitiveness, lowering import dependency, protecting against fluctuating energy prices, enhancing national security and reducing the threats of global warming and climate change. Such laws are generally comprehensive in the sense that they target the different economic sectors and a range of energy policy measures, some mandatory and others voluntary in nature.

The level of success however varies a lot from one country to another, depending on the priority given to energy efficiency in the national sustainable development framework and the means mobilised to translate the policy into action. Weak institutional capacity appears to be one of the key reasons for the gap between the planning and implementation of national energy efficiency policies. As a result, the institutional and coordination mechanisms are lacking and energy efficiency programmes are not always sustained, especially during periods when oil prices are low. On the other hand, when energy prices shoot up, many governments tend to protect end-users by subsidising energy and absorbing the economic liability. In such cases, there is a need for improving legislation, regulation, and standardisation and other policy and institutional measures.

Experience in several Asian countries shows that energy performance standards and labelling schemes for appliances and equipment are a cost-effective policy tool for transforming markets and encouraging energy-efficient products. Governments usually follow a process of consensus and negotiation of standards that the industry can meet with reasonable increases in prices. Initially a voluntary target is applied. As the market transformation proceeds, the targets are introduced as standards. However, standards may fail to induce sufficient energy-efficiency improvements if they are largely based on negotiations with industry members without any explicit standard-setting method and if they are not revised periodically.

Japan's "top runner" programme sets mandatory energy efficiency standards based on the most efficient or top-performing products in the market. This programme owes its success to the following:

- Periodical update and review of standards
- Consideration of future technological developments
- Consultation with industrial groups
- Flexible compliance mechanisms
- Clear communication mechanisms to the public

To conclude, the downward trend of energy intensity in most Asian developing countries is a good sign of the positive impacts of energy efficiency. However, we are still quite far from realising the significant potential that energy efficiency offers, at costs below the rising fossil fuel prices. Countries that still have a long way to go in the development process may consider taking a more aggressive attitude in order to tap energy efficiency to the fullest. This will enable them to achieve their developmental goals with the least adverse impact on the global environment. This is the intention of the program in India, highlighted below. According to Natural Resources Defence Council (NRDC), similar energy saving initiatives have been adopted by China, as part of the Copenhagen Accord process, with formal commitments for a 40–45% reduction in CO_2 emissions per unit of GDP by 2020, compared to 2005 levels.

Box 13:8 National action plan for climate change gives a boost to India's energy efficiency goals

India adopted the National Action Plan for Climate Change (NAPCC) which will allow the country to maintain high growth rates for increasing living standards of the vast majority of people and reduce their vulnerability to the impacts of climate change. To achieve key goals in the context of climate change, the National Mission for Enhanced Energy Efficiency (NMEEE) was retained as one of the 8 National Missions. NMEEE's objective is to promote innovative policy and regulatory regimes, financing mechanisms, and business models in order to create, sustain and market energy efficiency in a transparent manner with clear deliverables to be achieved in a time bound manner.

In addition to the on-going efforts to carry out action under the national Energy Conservation Act 2001, 4 new initiatives were introduced to enhance energy efficiency:

- **Perform Achieve and Trade (PAT)** – This is a market-based mechanism to enhance cost effectiveness of improvements in energy efficiency in energy-intensive large industries and facilities, through energy savings certificates which can be traded.
- **Market Transformation for Energy Efficiency (MTEE)** – This is a market transformation mechanism to accelerate the shift to energy efficient appliances in designated sectors. Innovative measures will make the products more affordable.
- **Energy Efficiency Financing Platform (EEFP)** – This is an innovative financing mechanism that will help finance demand side management programmes in all sectors, by capturing future energy savings.
- **Framework for Energy Efficient Economic Development (FEEED)** – This is a fiscal incentive mechanism to promote energy efficient investment.

The PAT is one of the most promising initiatives, implementing Best Available Technologies and Practices in energy-intensive large industries and facilities through economically viable projects. The principle is quite simple and straight-forward: energy-intensive large industries and facilities consuming energy above a certain threshold are notified by the government as designated consumers. This covers 9 sectors, namely thermal power plants, fertilizer, cement, pulp and paper, textiles, chlor-alkali, iron and steel, aluminium and railways. The baseline and energy efficiency improvement target are specific to each designated facility. When a designated consumer achieves and surpasses the target, it can sell its excess savings in the form of Energy Savings Certificates (ESCerts). On the other hand, if a designated consumer fails to achieve its targets, it must purchase the appropriate number of ESCerts to "meet" its energy savings target.

Accredited Energy Auditors will conduct monitoring and verification of energy savings through a transparent system.

Further reading 13

Factor Five: Transforming the Global Economy through 80% Improvements in Resource Productivity, The Natural Edge Project is an important contribution to a growing corpus of work regarding energy and resource efficiency. It provides a coherent framework and synthesis of the crucial issues of resource use efficiency and decoupling of production from material and energy throughput. There are numerous examples of resource productivity improvements from the most relevant sector.

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Part B

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About the UNEP Division of Technology, Industry and Economics

The UNEP Division of Technology, Industry and Economics (DTIE) helps governments, local authorities and decision-makers in business and industry to develop and implement policies and practices focusing on sustainable development.

The Division works to promote:

> sustainable consumption and production,
> the efficient use of renewable energy,
> adequate management of chemicals,
> the integration of environmental costs in development policies.

The Office of the Director, located in Paris, coordinates activities through:

- **The International Environmental Technology Centre** - IETC (Osaka, Shiga), which implements integrated waste, water and disaster management programmes, focusing in particular on Asia.
- **Sustainable Consumption and Production** (Paris), which promotes sustainable consumption and production patterns as a contribution to human development through global markets.
- **Chemicals** (Geneva), which catalyzes global actions to bring about the sound management of chemicals and the improvement of chemical safety worldwide.
- **Energy** (Paris), which fosters energy and transport policies for sustainable development and encourages investment in renewable energy and energy efficiency.
- **OzonAction** (Paris), which supports the phase-out of ozone depleting substances in developing countries and countries with economies in transition to ensure implementation of the Montreal Protocol.
- **Economics and Trade** (Geneva), which helps countries to integrate environmental considerations into economic and trade policies, and works with the finance sector to incorporate sustainable development policies.

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Sustainable Consumption and Production: A Handbook for Policy Makers, developed by the United Nations Environment Programme (UNEP) with the financial support of the European Commission, provides a comprehensive introduction to developing policy for Sustainable Consumption and Production (SCP), designed specifically for the Asia-Pacific region. Part A of the manual provides an introduction to SCP and the policy cycle, reviewing various policy tools and instruments available to policy makers. The rapidly growing consumption and production trends in Asia and the Pacific are examined, highlighting the urgent need for a transition towards SCP. Part B focuses on specific policy opportunities for cleaner and safer production, sustainable lifestyles, sustainable cities, sustainable public procurement and sustainable tourism, showcasing a number of inspiring and successful SCP policies and initiatives from across the region. This manual highlights opportunities in Asia and the Pacific for the transition towards SCP, a key element for achieving sustainable development.

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