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Mainstreaming Eco-innovation **in Sustainable Consumption and Production Policies**

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FOREWORD

Creating a context that allows small and medium-sized companies to blossom and grow not only allows those businesses to strengthen their positions nationally and internationally, but allows them to add value to the communities in which they operate. By embedding sustainability at the core of those businesses, and their dealings with their partners, the companies become stronger, more resilient in a rapidly changing landscape, and the communities of which they are a part are helped on to a long-term path of sustainable development. Creating a context in which companies successfully adopt and advance sustainable consumption and production is what eco-innovation is all about.

Despite the many benefits of eco-innovation, significant barriers still hinder its wider uptake in our economies. This report, Mainstreaming Eco-innovation in Sustainable Consumption and Production Policies, identifies some of these barriers, and specifically those originating from the policies in place that determine the context in which companies operate. This report helps policy makers better understand the benefits of eco-innovation and the contribution it can make towards sustainable development and national objectives. It provides practical guidance on how to align Sustainable Consumption and Production and Science, Technology and Industry policies to this objective.

This report also reflects the results of a three-year effort within the context of the Resource Efficiency and Eco-innovation in Developing and Transition Economies project, funded by the European Commission. UN Environment worked with the governments of Colombia, Peru, Kenya and Vietnam to identify policies that would enable a more rapid uptake of eco-innovative solutions. In the course of this project, private and public-sector experts worked in parallel to reinforce the technical understanding and the enabling conditions for eco-innovation.

I hope that the practical guidance and the inspiring examples offered in this publication will accelerate the uptake of eco-innovative solutions in a conducive policy framework, thereby ensuring progress towards one of the global goals countries have agreed to, Goal 12 on sustainable consumption and production patterns.

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Abbreviations

2030 Agenda	2030 Agenda for Sustainable Development
AC	Alternating current
CNPMLTA	Colombian National Cleaner Production and Environmental Technologies Centre
CEP	Committee on Eco-innovation Peru
CINC	Chamber of Tyre Industry
CNP+LH	National Cleaner Production Centre of Honduras
COHEP	Honduran Council of Private Enterprise
COLCIENCIAS	Administrative Department for Science, Technology and Innovation
CP	Cleaner Production
CPC	Cleaner Production Council
CSIR	National Cleaner Production Centre
CSR	Corporate Sustainability Reporting
DC	Direct current
EEA	Ministry of State for Environmental Affairs
ENCPC	Egyptian National Cleaner Production Centre
EMAS	EU Environmental Management and Audit Scheme
EPD	Environmental Product Declarations
EPR	Extended Producer Responsibility
GESIP	Green Economy Strategy and Action Plan
GII	Global Innovation Index
KNCPC	National Cleaner Production Centre of Kenya
IPP	Integrated Product Policy
R&D	Research and Development
REEDTE Project	Resource Efficiency and Eco-Innovation in Developing and Transition Economies Project
RECPnet	Resource Efficiency and Cleaner Production network
SC	Steering Committee
SCP	Sustainable Consumption and Production
SDGs	Sustainable Development Goals
SERNA	Secretary of Natural Resources and Environment
SIC	Secretary of Industry and Commerce
SME	Small and medium sized enterprises
SPP	Sustainable Public Procurement
SSS	Specialised Solar Systems
STI	Science, Technology and Industry
VA	Voluntary Agreement
VAT	Value Added Tax

Executive summary

Transitioning to an inclusive green economy based on sustainable consumption and production patterns requires new sustainable business strategies and models and a supporting policy framework. Creating new sustainable business strategies and models in response to environmental, economic and social challenges is a process of eco-innovation. By applying life cycle thinking and engaging with partners across the value chain, eco-innovation helps to incorporate sustainability into business decision-making and to develop new business strategies, models and products. Eco-innovation provides a competitive advantage to business by creating win-win opportunities for economic development, positive impact on society and reducing harm to the environment.

While there is a clear business case for eco-innovation, overcoming barriers to eco-innovation needs government support. Barriers to eco-innovation include insufficient economic incentives, low consumer demand, perverse incentives, limited access to finance, weak absorptive capacity and fragmented systems of innovation. These barriers need government policy action to motivate and support businesses in developing sustainable business models and strategies.

An integrated policy approach that coordinates and links relevant areas of policy is essential for eco-innovation. In particular, policies for eco-innovation can draw on sustainable production and consumption, environmental protection, industrial development as well as science, technology and innovation policy frameworks to create a holistic system response.

The coordination, design and implementation of policies for eco-innovation rest on the following key principles: life cycle thinking, value chain approach, partner collaboration, policy integration as well as on a long-term

view. Life cycle thinking considers the entire resource flow and related social and economic impacts across a good or service's life. It is linked to a value chain approach when applied within a business context as it helps to delineate the chain of decision-makers and their actions for better policy targeting. Building partner collaborations can help realising the full potential and market value of possible solutions to common sustainability problems affecting the value chain of a business. Policy integration allows to take full stock of a context (a system), which a particular policy decision addresses and affects with an idea of building positive and productive synergies. A long-term view with high level policy commitment and perseverance is a desirable principle for any policy area including eco-innovation given its potential for a system-wide change.

All policy instruments can be used to support eco-innovation: regulatory, information-based, economic, voluntary and behavioural instruments. Eco-innovation policy implementation requires coordination between actors, mobilisation of skills, services and resources. Coordination mechanisms may need to be aligned to policies and actors, while mobilisation of skills, services and resources is essential when fostering eco-innovation in both existing and start-up business communities. Examples of implementation of Malaysia's Green Technology Financing Scheme, Sweden's tax reduction for repairing products and Israel's innovation policy system, highlighted in this publication, provide policy learning opportunities.

Professional, technology and innovation service providers, such as members of the Resource Efficiency and Cleaner Production network (RECPnet), can assist in developing and implementing eco-innovation policy. Service providers can contribute to eco-innovation policy at each stage of the policy cycle (problem framing, formulation, implementation and monitoring and evaluation) through their unique role as intermediaries between companies, especially Small and Medium Sized Enterprises, government and other relevant institutions. This type of Service Provider organization was implemented by the UN Environment Eco-innovation Project. Their experience in assisting governments to review existing policy frameworks, training policy-makers and informing relevant public sector stakeholders of business environmental challenges and opportunities for eco-innovation has generated useful lessons learned which can serve as practical guidance for developing and implementing policies for eco-innovation.

Preface

I. Context

The objective of UN Environment's Resource Efficiency and Eco-Innovation in Developing and Transition Economies Project (Eco-innovation Project) is to develop resources and capabilities for eco-innovation in developing and emerging economies.

UN Environment has partnered with service providers, particularly members of the Resource Efficient and Cleaner Production network (RECPnet1), to provide technical assistance with eco-innovation to small and medium sized enterprises (SME) and to review national and local government eco-innovation policies.

The Eco-innovation Project targets the key conditions for eco-innovation: making the business case for eco-innovation, enhancing policy context to promote more eco-innovation in businesses, developing technical expertise and capability for the adoption of eco-innovation, and fostering regional and international collaboration. The ultimate goal of the Eco-innovation Project is to enhance the business sector's contribution to the achievement of resource efficiency and promote a shift towards sustainable consumption and production patterns.

The Eco-innovation Project implemented national level activities in a total of nine countries. Policy review was a component of the activities in four of these countries.

1/ Resource Efficiency and Cleaner Production network (RECPnet) is joint initiative of UN Environment and UNIDO to a global network of organisations to mainstream and scale up applications of RECP concepts nationally and globally in developing and transitioning countries. Further information is available online at www.recpet.org.

In Colombia, Kenya, Peru and Vietnam, the Eco-innovation Project policy activities included the review and assessment of national strategies and policies, collaboration with national government and other related policy stakeholders to build knowledge and develop a roadmap for action to mainstream Sustainable Consumption and Production (SCP) policies for eco-innovation. The knowledge and experience gained in developing policy for eco-innovation are presented in this publication.

II. Purpose

The overall objective of this publication is to provide practical guidance for policymakers and service providers to create a policy context that is conducive to eco-innovation, thus enabling systemic changes in production and consumption patterns.

More specifically, this publication aims to help policymakers better understand the benefits of eco-innovation and the contribution it can make towards sustainable development. It provides guidance on how SCP policy and Science, Technology and Industry (STI) policy can support eco-innovation and how a conducive policy context for eco-innovation can be set.

Finally, it aims to inform service providers on how they can effectively engage at the different stages of the SCP policy cycle, scaling up their interventions in order to improve the context for eco-innovation. Given the fact that service providers work mainly with SMEs, the focus is particularly on policies that can support those enterprises to follow an eco-innovative path.

This publication presents a broad range of examples across industry sectors, environmental aspects and geographical areas. It illustrates the results of national level policy activities implemented in Colombia, Peru, Kenya and Vietnam.

III. Target audience

As referred to above, this publication has two target audiences. The first are policymakers at the national, regional and local level. The second are service providers who wish to support the creation of the right policy conditions for eco-innovation to flourish and help achieve more sustainable patterns of production and consumption.

IV. Methodology

The findings of this publication are based predominantly on primary sources, including information from interviews and through an expert workshop conducted with service providers, policymakers and other technical experts.

It draws from the results of the national level activities that focused on policy review and assessment, as well as the roadmaps for action to integrate eco-innovation into national strategies and policies. Desktop research has contributed to this publication and the REEDTE Project.

V. Structure

This publication is divided into five chapters: (1) Concept of Eco-Innovation, (2) Defining the role of service providers, (3) Policy context of eco-innovation, (4) Principles of

innovative policy design, and (5) Role of service providers. These chapters can be read individually according to a user's interests and needs. Throughout the publication, the chapters are illustrated with examples from the UN Environment Eco-innovation Project and elsewhere.

Chapter 1 introduces the concept of eco-innovation, its benefits, the barriers to its diffusion and the need for corresponding policy measures to address these barriers. It explains the SCP and STI policy context, in which eco-innovation policy can be mainstreamed.

Subsequently, the policy cycle is described, highlighting the rationale for active involvement of service providers in all stages of the policy cycle.

Chapter 2 and 3 demonstrate policies for eco-innovation. While Chapter 2 focuses on the definition and role of service providers, Chapter 3 provides the policy context of eco-innovation.

Chapter 4 elaborates on several principles for eco-innovation policy design. Following these principles, a categorisation and non-exhaustive list of policy instruments is explored which can create enabling conditions for eco-innovation. Case studies are highlighted from various regions to demonstrate how instruments have been applied to overcome the current barriers to eco-innovation and to support long-term policy objectives.

Examples from the national level activities illustrate the results of the policy component of the Eco-innovation Project to review and assess existing policy frameworks for eco-innovation. This chapter pays specific attention to how different types of instruments work best when they are combined. A checklist of questions to be asked when developing policy instruments for eco-innovation is provided at the end of the chapter.

Chapter 5 focuses on the different roles service providers can play during each of the four main stages of the policy cycle from problem framing, to policy formulation, implementation, and to monitoring and evaluation. The applicability and effectiveness of these suggested roles depends on several factors, which are outlined before moving to the description of the potential roles of service providers throughout the policy cycle. Policy contributions are illustrated using case studies, while tips and references are provided for further guidance.

CHAPTER **ONE**

Introducing **eco-innovation and the policy context**

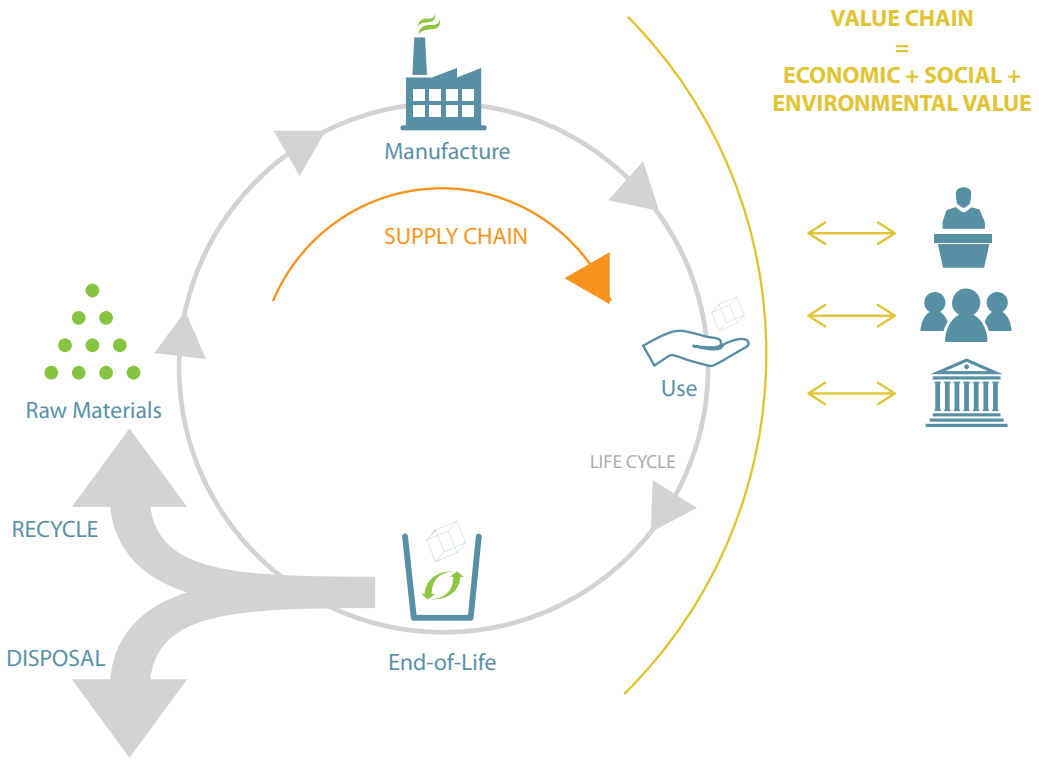
This chapter introduces the concept of eco-innovation, the barriers to its diffusion and the need for corresponding policy measures to address these barriers and promote eco-innovation. It then explains why in particular SCP and STI policies offer learning opportunities for eco-innovation policy frameworks. Finally, it briefly describes the policy cycle, highlighting the opportunities and rationale for service providers contributing to all stages of the policy cycle.

1.1 WHAT IS ECO-INNOVATION?

Eco-innovation is a process, which by operating at the value chain level of a business, can program systemic change in a company. It can make a considerable contribution to sustainable development in the market and society.

At the company level, eco-innovation moves beyond short-term and incremental improvements towards a more strategic and holistic view of sustainability as a key factor in decision-making among actors across the entire value chain of the company. Operationally, eco-innovation is implemented from the level of a business strategy, incorporating sustainability throughout all operations. By implementing a set of coordinated modifications to

Figure 1.1 : Differences between supply chain, lifecycle and value chain



> Eco-innovation is the development and application of a business model, shaped by a new business strategy that incorporates sustainability throughout all business operations based on lifecycle thinking and in cooperation with partners across the value chain. It entails a coordinated set of modifications or novel solutions to products (goods/services), processes, market approach and organisational structure, which leads to a company's enhanced performance and competitiveness.

products and services, processes, market approaches, stakeholder relations and organizational structures, eco-innovation enables the creation of novel solutions tailored to customers' needs. Eco-innovation helps to change the economic system, from the company and its value chain, with ripple effects through the economy.

Eco-innovative companies apply lifecycle thinking, which considers all phases of product life: from extraction of raw materials through to material processing, manufacturing, distribution, use and maintenance, to disposal or re-use. This perspective allows companies to evaluate where significant progress can be made against major challenges, and anticipate and avoid future risks. Some of these risks can only be addressed jointly and collaboratively with partners of the value chain, including research bodies, universities and private sector partners across different sectors to share knowledge and expertise.

Through combining expertise and resources, collaboration helps to address common sustainability issues affecting businesses. Collaboration through eco-innovation generates shared benefits such as savings and improving value propositions while creating productive synergies between economic, environmental and social goals. The scope of supply chain, lifecycle and value chain is sketched in Figure 1.1.

Collaboration across sectors and value chains offers greater forms of eco-innovation, which can achieve transformation of consumption and production systems. Transformational change requires novel interactions between policy and regulation, business cultures and practices, as well as consumer attitudes and behaviour, which is possible through eco-innovation.

1.2 BENEFITS OF ECO-INNOVATION

At the company level, a growing number of businesses have demonstrated profit opportunities identified along the value chain through implementing eco-innovation.[2] It has helped businesses grow and achieve a significant advantage over their competitors. The potential of SMEs is to bring about system-wide change, as they are the most prevalent type of business and contribute approximately 45% of formal employment[3] and job creation in developing and emerging economies.[4] Their impact on both the environment and society is significant, while their small size enables more agile decision-making and flexibility for eco-innovative changes compared to larger companies.

At the government level, many have realized the win-win opportunities for eco-innovation to significantly enhance competitiveness and economic development. More widespread implementation of eco-innovation in companies, and especially SMEs, pushed and pulled by effective combinations of policies can contribute to the alleviation of resource constraints and environmental degradation, improvement of social welfare and local community engagement, job creation and attracting financial resources. The 2016 analysis of 185 eco-innovation projects funded by the European Commission in the period 2008 – 2013 for promoting eco-innovation among SMEs showed that "total estimated environmental savings reached an annual of €1.2 billion, two years after the projects' closure". In addition, the eco-innovation projects had a side benefit of generating, "an average of nine full time equivalent jobs per project".[5]

The process of eco-innovation enhances country knowledge and skills, while increasing the competitiveness of the economy. The German government's combination of regulatory frameworks and economic incentives has spurred investment and innovations to create new markets for eco-innovative solutions. Eco-innovation in the areas of renewable energy generation, energy and material efficiency, sustainable water management and mobility contributed 13% to the GDP in 2013.[6]

Eco-innovation has multiple benefits for society as it can reduce health and environmental risks by decreasing uses of hazardous and toxic chemicals. At the same time, eco-innovation can improve economic returns through job creation and by generating new sources of value for productive growth. New jobs are generated through higher demand of emerging industries for sustainable products and services as well as in existing industries through higher demand for sustainable products and services. Eco-innovative solutions bring crucial social benefits such as improved access to energy, water, and sanitation, which are particularly relevant for developing countries to meet basic needs.

Eco-innovation therefore actively contributes to decoupling economic growth from resource consumption and help achieve the Sustainable Development Goals (SDGs). The Agenda for Sustainable Development for 2030 which encompasses 17 SDGs adopted in September 2015, represents a challenging and complex aspiration with a web of interrelated goals and targets. This can be only achieved in an integrated way and with concerted efforts of all stakeholders with any active role being played by the private sector.

Eco-innovation applied by businesses with solutions scaled through their value chains has the potential to reduce resource consumption and stabilize resource supply and prices for long-term prospects of productive growth, which is important for human development. Thus, the promotion of eco-innovation is an important policy objective within the overall development framework of a country.

2/ UN Environment (2014) The Business Case for Eco-Innovation, online at http://web.unep.org

3/ World Bank Group (2015) Small and Medium Enterprises (SMEs) Finance, online at https://www.worldbank.org

4/ Ayyagri et al. (2011) Small vs. Young Firms Across the World: Contribution to Employment, Job Creation, and Growth, online at https://papers.ssrn.com

5/ Executive Agency for SMEs (2016) Eco-innovation: where business meets environment, online at https://ec.europa.euprojects

6/ Federal Ministry of Environment, Nature Conservation, Building and Nuclear Safety (2014) GreenTech made in Germany 4.0, online at http://www.bmub.bund.de

Box 1.1: **Policies for eco-innovation in South Africa**

South African national and local government policies are spurring the emergence of bottom-up and systems thinking initiatives supporting sustainability-oriented innovation. Each year ministers of relevant departments attend business forums to better understand the needs of the industry to develop and make linkages with supportive policies.

These supportive policies include national level programmes such as the Vision 2030 Long-Term Plan, which details a new growth path to green the economy; the 10-year Innovation Plan for South Africa; Green Economy for Sustainable Development Programmes; Greener Municipality competitions; and Trade and Industry Policies such as Sustainable Public Procurement and numerous SME-focused support mechanisms to promote late-stage research and development, product-to-market support, and business and innovation incubators. System-thinking based principles from the complex adaptive theory are part of the approach to policy design in some departments.

This context has paved the way for local government schemes to build on these policies, and create an enabling context for eco-innovation. For example, the Western Cape Government has initiated a smart specialisation policy for more productive and innovative businesses as well as an electrification scheme to create an energy supply infrastructure for rural communities based on renewable energy.[7]

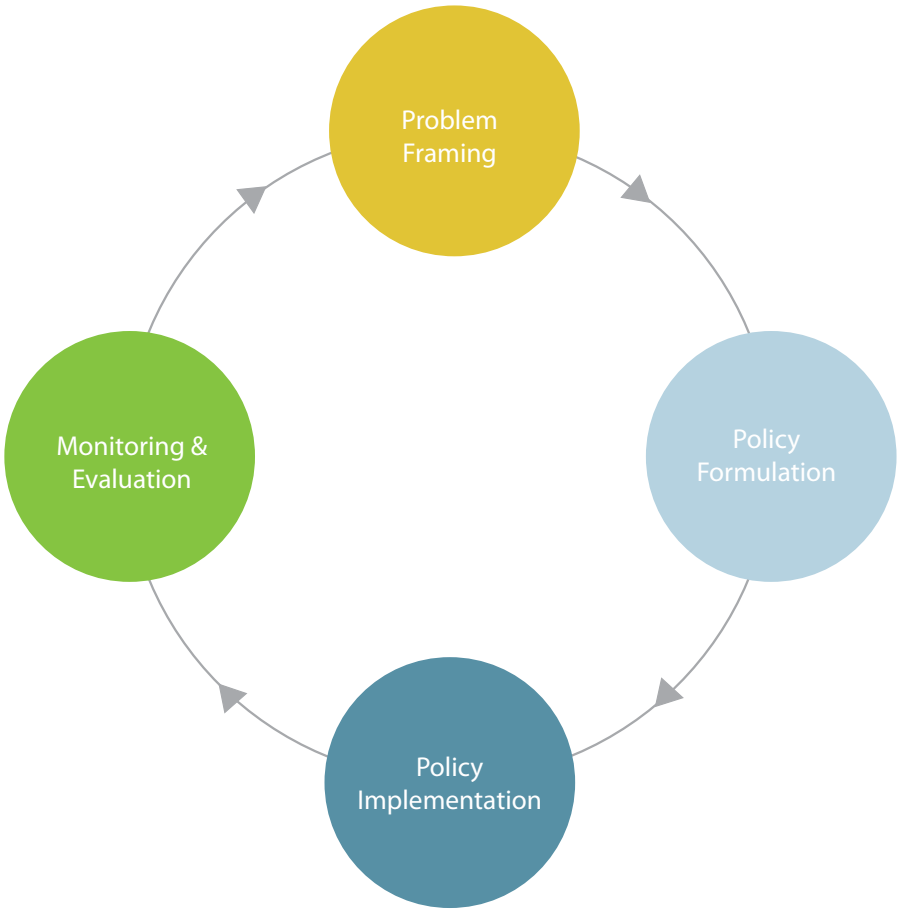
SMEs such as Specialised Solar Systems (SSS) benefited from this scheme, collaborating with a number of local technical institutes to develop and diffuse a direct current (DC) micro grid kit fed by solar power in the market. The kit was developed based on lifecycle thinking, and is sold as a service-system at a price that is considered affordable by the target market. In addition, SSS modifies home appliances to function on DC, which uses two thirds less energy compared to alternating current (AC).

Given that many areas in South Africa are not covered by a traditional AC-based energy supply infrastructure, SSS has demonstrated the application of an advanced technology and moved beyond previous lock-in to less efficient systems. In three years, SSS tripled in size to become one of the main suppliers to the rural electrification programme of the local government. This type of scheme provides an enhanced infrastructure for energy access from renewable sources to rural communities with limited or no energy access – hence providing a more efficient and sustainable solution, while contributing to other social objectives such as poverty alleviation.

7/ Provincial Government of the Western Cape (2007) Sustainable Energy Strategy for the Western Cape, online at https://www.westerncape.gov.za

© Specialised Solar Systems

Figure 1.2: The policy cycle



1.3. THE POLICY CYCLE AND THE ROLE OF SERVICE PROVIDERS

1.3.1 THE POLICY CYCLE

Throughout the REEDTE Project, RECP***net*** service providers have expressed interest in contributing their specific expertise, knowledge and skills to the development and implementation of eco-innovation policies. To make an effective contribution, it is useful to look at the policy cycle as a sequence of four main stages: (1) progressing from problem framing, through to (2) policy formulation and (3) policy implementation, to (4) monitoring and evaluation. These main stages, which may vary depending on national context, are illustrated in Figure 1.2. The stages and the key steps within each of them are summarised in Table 1.1.

The characteristics of the policy stages depend on the complexity of the issue, the stakeholders involved, and the intricacy of the political system of a country. Although this will vary from country to country, the policy cycle is a useful framework through which to understand that policy creation progressively builds upon prior activities with a view to achieving future objectives. It demonstrates that multiple opportunities exist to review, amend, and create new strategies to effect change. In this sense, the policy cycle is a useful representation and which shows the potential contribution points for service providers.

Table 1.1: **Key steps within the four stages of the policy cycle**

STAGE OF THE POLICY PROCESS	STEPS
PROBLEM FRAMING **This stage involves raising awareness on issues related to SCP, which require policy interventions. Information gathering and discussion between the policy community and the public regarding possible solutions also falls under this stage.**	✔ Identification of relevant problems and associated goals ✔ Identification and monitoring of public concern about the issues ✔ Development of a common understanding of the barriers and underlying causes of the issues ✔ Stakeholder engagement and coalition building to debate issues and find most effective solutions ✔ Assessment of risks, uncertainty and consideration of issues from lifecycle perspective, understanding the cost of inaction ✔ Assessment of existing policies, their limitations and institutional settings ✔ Definition and framing of policy problems
POLICY FORMULATION **This stage involves identifying guiding policy principles, developing policy positions, defining policy goals, adopting new or amending existing policies and selecting appropriate policy instruments**	✔ Development of guiding policy principles ✔ Construction of general policy statement ✔ Definition of measurable policy goals and timeframes for their implementation ✔ Cost benefit analysis of proposed policy options ✔ Public consultation on policy options ✔ Consideration of policy strategies and instruments Implementation planning: work plans and resource allocation
POLICY IMPLEMENTATION **This stage involves implementation of policies, undertaking communication and enforcement activities, and establishing monitoring mechanisms.**	✔ Establish statutory, institutional and resource requirements ✔ Planning and implementation of communication, education and information strategies ✔ Advocacy of policies ✔ Mobilisation of relevant stakeholders and identification of their roles and responsibilities in policy implementation process ✔ Selection of policy instruments ✔ Creation of public/private partnerships for implementation of policies ✔ Establishment of policy monitoring mechanisms ✔ Adjustment of the plan as necessary
MONITORING & EVALUATION **This stage involves ongoing monitoring of the policy and evaluating its effectiveness, identifying results and lessons learned in order to inform a new phase of the problem definition.**	✔ Ongoing monitoring of progress and routine data collection ✔ Evaluation and review of process to understand if the policy fulfils its original purpose and if there are any unintended outcomes ✔ Extension, adaptation, redesign or cessation of policy and/or goals ✔ Initiation of a new policy cycle

CHAPTER **TWO**

The role of **service providers in SCP policy**

Service providers are organizations that function as business and government intermediaries. Service providers, particularly members of RECP***net***, have a diverse portfolio of services depending on their specific mandate, skills, competencies and interests, as well as the context in which they operate. Their primary role is to promote environmental sustainability in the business sector.

To this end, service providers offer companies, in particular SMEs, training and advisory services, implementation support, as well as assistance with the identification, adaptation and development of technological solutions. Networking and advocacy represents another set of activities undertaken by service providers. This goes beyond public relations to include knowledge acquisition and sharing, awareness raising and outreach.

Given their work, positioning and expertise, service providers are well placed to play an important role supporting government to establish conducive SCP policy for eco-innovation by contributing to one or more of the four stages of the policy cycle. Through providing key information to government and regional bodies, and as a natural convenor between industry and policymakers, service providers can help to inform the right selection and design of SCP policy instruments addressing realities on the ground and creating a conducive environment for eco-innovation. This contribution utilises service provider skills and strengths and enables further assistance during policy implementation.

In many countries, service providers are viewed as an arm of government for policy implementation. Service providers increasingly recognise that engaging in the policy process can directly or indirectly benefit their own project portfolio, because a more conducive policy environment focused on SCP and eco-innovation creates more demand from industry for assistance to identify opportunities and take actions that meet policy requirements.

Given their work, positioning and expertise, service providers are well placed to play an important role supporting government to establish conducive SCP policy for eco-innovation by contributing to one or more of the four stages of the policy cycle.

The experience of service providers in engaging with the SCP policy cycle has mostly occurred in the problem framing stage of the policy cycle. As will be discussed in Chapter 5, noteworthy and promising attempts have been made to play a more active role in the other stages of the policy cycle. Other roles include assisting policy design, implementation, monitoring progress and evaluating results. Additional modalities of engagement that service providers can play in the four steps of the SCP policy cycle are provided in Chapter 5.

© RECPnet

Policy context of **eco-innovation**

CHAPTER **THREE**

3.1 BARRIERS TO ECO-INNOVATION

Despite the many benefits of eco-innovation, the key reasons why it has not received much wider application are barriers of the market and overall system. These barriers and gaps include lack of incentives and weak support systems.
Presented below is a list of some barriers to eco-innovation frequently encountered in previous studies.[8]

This list is not exhaustive as barriers depend on the dynamics and complexity of a specific national context. Their effects are also often interlinked and cannot be addressed in isolation and by a single solution. It is therefore important for policymakers to understand the nature of these barriers, the reasons why they occur and how they limit eco-innovation.

This understanding, as well as communication and coordination among policy frameworks and related stakeholders, can help to design flexible and relevant combinations of policy interventions. Policy recommendations to overcome barriers and gaps are given in Chapter 4.

> Eco-innovation enacted by a company leads to changes in the value chain and potentially the global market.

8/ The list of barriers to eco-innovation is drawn from: Carillo-Hermosilla J. et al (2009). Eco-innovation: when sustainability and competitiveness shake hand; Kemp (2011). "Ten themes for eco-innovation policies in Europe", S.A.P.I.EN.S, 4, pp 1-19; Woolthuis R.K. et al (2005), "A system failure framework for innovation policy design". Technovation 25; Dogson M et al (2011). "Systems thinking, market failure, and the development of innovation policy: the case of Australia" Research Policy 40.

Table 3.1: **Barriers to eco-innovation**

Insufficient economic incentives	The market fails to capture the benefits of eco-innovation and does not offer sufficient economic return to companies that are ahead. Namely, the costs of negative externalities (e.g. external costs to society) are not sufficiently reflected in actual costs of production. This can be due to the lack of appropriate regulatory frameworks, civil society pressures or perverse subsidies.
Perverse incentives	Subsidies for the use of natural resources such as fossil fuels or water distort the market and further encouraging their depletion.
Insufficient consumer demand	As global demand for sustainable products (goods or services) increases, consumer awareness about sustainability imperatives in many countries is still low. There is a lack of information and guidance for consumers to help them select more sustainable products and modes of consumption. Additionally, in developing countries, sustainable products are often considered an expensive luxury. This may result in general cultural and institutional norms in the market that do not encourage corporate transparency and environmental and social responsibility. In the end, this may lead to insufficient consumer demand for sustainable products.
Limited investment and access to finance	The cost of implementing eco-innovation can involve up-front investment with a pay-back period. This may be an inhibiting factor for many companies, especially SMEs, which often have limited financial resources to invest into developing and adopting eco-innovative solutions and have difficulty of attracting both public and private investment. Ineffective protection of intellectual property (IP) can hamper investment for innovation. For instance, the IP context needs to be clear to ensure that upfront investment can be recovered and yet not too restrictive in order not to limit collaboration, knowledge spill-over and cross learning.
Limited absorptive capacity	Developing countries tend to have weaker absorptive capacity, that is, capacity to assimilate and apply new knowledge. This is especially true for SMEs, which in addition to limited technical and organizational capacity, SMEs often have a basic lack of information about existing market opportunities or insufficient contact with experts and larger networks, which are needed to diffuse eco-innovation skills and competencies. Local universities, as well as technical institutes, may be lacking the right expertise to successfully provide the necessary skills at the national level.
Weak systems for innovation	Innovation requires a supportive system to enable interaction between companies, universities and technical research institutions. Collaboration and cooperation lead to interactive learning, flow of research and technology into industry for successful commercialisation and diffusion of eco-innovative solutions. These interactions and diffusion do not take place in weak systems. The effectiveness of systems depends on efficient coordination and facilitation, a role that can be played by government with the help of service providers.

3.2 ECO-INNOVATION AS A SYSTEM INNOVATION POLICY APPROACH

Widespread adoption of eco-innovation can effect systemic change. Eco-innovation enacted by a company leads to changes in the value chain and potentially the global market. Innovation is required to help companies break out of existing business paradigms, which are largely unsustainable in the fact of contemporary environmental and social challenges. In this context, eco-innovation has the following key four components:

It aims to reconcile and align the profitmaking rationale of traditional business with environmental and social impacts, which are the results of market and system failures described above as barriers to eco-innovation.

Change at a systems level can only be triggered by a different type of holistic thinking. Lifecycle thinking offers a useful framework to break down the complexity of a large system and its sustainability into a logical chain of decisions and actions by various actors.

It is a top-down, strategic, vision driven process that generates solutions which are long-term orientated and radical in nature and as such, more disruptive.

Achieving the scale of the required change is easier, if not only possible, through collaborative and interactive partnerships among multiple stakeholders.

According the recent OECD report, this scope and ambition requires system innovation policy approach which builds on similar aspects as eco-innovation.

System innovation policy has a similar scope and ambition to eco-innovation policy. System innovation policy aims to address social challenges which can only be tackled with the adoption of a system-wide perspective.[9] Progress can only be made if the objective of system change is accepted and driven by effective leadership and embedded in the national development agenda. The change needs to be effected at multiple points and levels and therefore focus not only on technical solutions, but organizational and social aspects of the system.

As such, the role of policy is not only in regulation and providing incentives It is also about mobilising different types of stakeholders across various constituent parts of the socio-technical system and facilitating productive partnerships and cooperation to promote fusion and competition between ideas in the quest for most effective solutions. Chapter 4 outlines some key principles that help guide the development and formulation of these types of policies and provides practical guidance on policy options.

The system innovation approach responds well to the ambition and scope of change set in the 2030 Agenda for Sustainable Development (2030 Agenda). The 2030 Agenda is composed of SDGs and builds on a number of high level political commitments on sustainable development including the Paris Agreement on Climate Change. Its adoption represents an important universal recognition of the notion that the achievement of sustainable development is the responsibility of all countries and stakeholders.

The key idea underlying the SDGs, targets and indicators, is the need for a major paradigm shift in a currently inefficient system. The goals in the 2030 Agenda structure are deliberately connected, implying a collective and coordinated effort and holistic perspective in approaching the challenges. It envisions a particularly important role for the business sector as without their involvement, the achievement of a range of goals is not feasible. Eco-innovation responds directly to Goal 8 ('Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all'[10]) and Goal 12 ('Ensure sustainable Consumption and Production Patterns'[11]).

Eco-innovation is a tool to respond to the 2030 Agenda in a practical way by building competitive, sustainable and viable businesses. The task of system innovation is complex and demands innovation from policymakers to try new approaches and to address issues holistically on both supply and demand sides. Box 3.1 presents an example of Israel's policies to promote eco-innovation focusing particularly on water management issues. The country has been steadily rising in the ranking of the annual Global Innovation Index (GII).[12]

9/ OECD (2015) System Innovation: Synthesis Report, online https://www.innovationpolicyplatform.org

10/ Sustainable Development Goal 8 information available at https://sustainabledevelopment.un.org

11/ Sustainable Development Goal 12 information available at https://sustainabledevelopment.un.org

12/ Global Innovation Index (2016) Indicator Analysis, online at https://www.globalinnovationindex.org

The GII aims to capture innovation input and output factors. On the input side, it evaluates the state of institutions, human capital and research, infrastructure, market conditions and business environment. On the output side, it measures resulting knowledge, technology and creativity.13 All these factors are key to creating an enabling environment for eco-innovation in a country.

3.3 ECO-INNOVATION AND SCP POLICY

Eco-innovation actively contributes to decoupling economic growth from resource consumption and help achieve the SDGs, particularly Goal 12: ensure sustainable consumption and production patterns. Through the adoption of the 2030 Agenda, the international community has recognised that current patterns of consumption and production are unsustainable and that there is a need to systematically change consumption and production patterns. Goal 12 is viewed as a cross cutting imperative to all other commitments represented by the 2030 Agenda given its strong link to resource efficiency, consumption and lifestyle issues.

In this context, the SCP framework is fully aligned with the objectives and principles of the system innovation approach, drawing from a range of policy mandates, and therefore considered in this publication as a relevant channel to mainstream eco-innovation.

Eco-innovation and SCP policy have similar goals and frameworks. The SCP framework encompasses strategies, policies and instruments to consider and minimise the negative environmental and social impacts from all lifecycle stages of consumption and production processes while promoting quality of life for all. SCP offers a holistic perspective to align society and the economy with the goals of sustainability as well as concrete operational approaches targeting different sectors, stages of lifecycle and various market players that make consumption and production choices.

SCP policy has evolved from end-of-pipe approaches such as pollution control, through to cleaner production initiatives, to considering the entire value chain and lifecycle of products. The focus on SCP framework on consumption patterns provides many policy options for promoting more sustainable consumption choices and behaviours by consumers.

13/ Global Innovation Index (2016) Framework, online at https://www.globalinnovationindex.org

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The SCP policy framework[14] offers an extensive list of policy instruments for promoting SCP. They include regulatory, economic, informational and voluntary programs and measures, which in combination provide effective policy mixes to promoting SCP and eco-innovation. Eco-innovation can in turn provide a concrete means through which the private sector can contribute to the achievement of the overarching SCP objectives and the 2030 Agenda in a practical and beneficial manner.

3.4 ECO-INNOVATION AND STI POLICY

STI is a highly relevant policy domain for eco-innovation. Eco-innovation provides a strategic business approach that can help define the technological needs and opportunities of a company. Technology assessment functions both as source of technology innovation and an important channel for technology diffusion. Both functions are a traditional focus of STI.

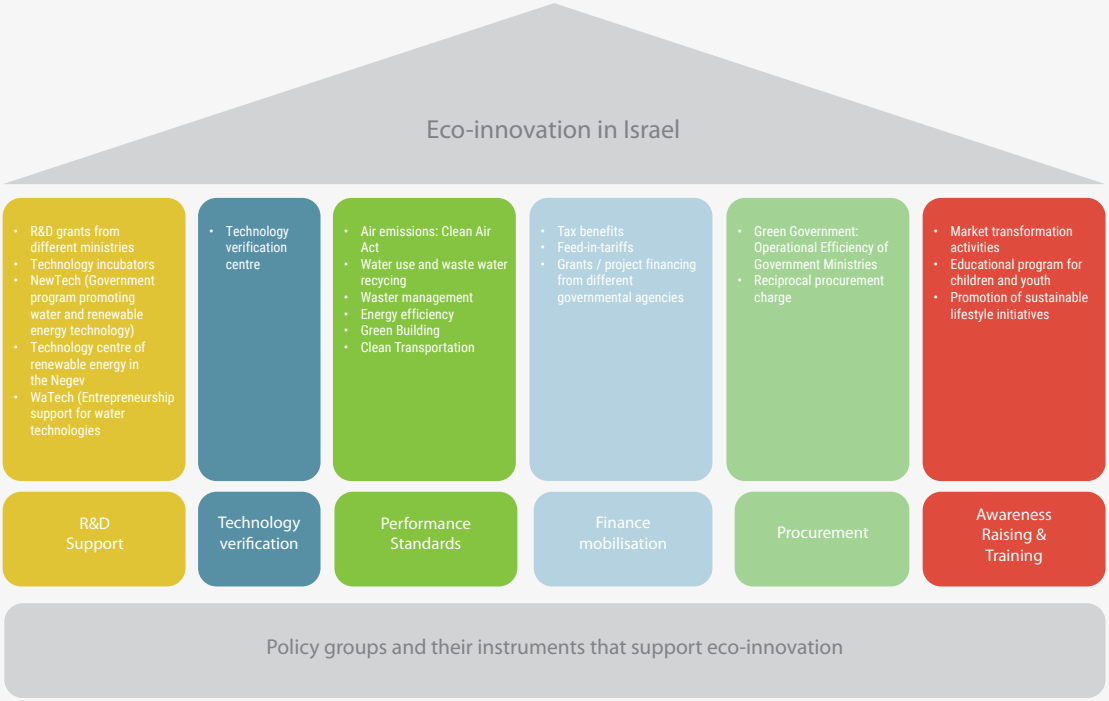
14/ UN Environment (2013) Sustainable Consumption and Production- A Handbook for Policy Makers 2nd Ed., online at http://www.switch-asia.eu

Box 3.1: **Systems approach to innovation – Israel**

Israel is well known for its high level of innovation and entrepreneurship, especially in high and clean technology. This is the result of the national agenda which sets the objective of advancing Israel's economic competitiveness and addressing its priority challenges – energy and water independence – through eco-innovation. Israel's water sector has seen major innovations both in terms of technology outputs and policies that create favourable conditions for innovation. It can be considered a good example of how a country has overcome the challenges of a water-scarce environment to build an advanced economy.

Israel's policy mix promotes eco-innovation in a balanced and holistic way targeting both supply and demand sides. The resulting break-through innovations include the possibility to treat and reuse of almost all the nation's domestic wastewater for irrigation in the agricultural sector. The advanced irrigation methods include moisture-sensitive automated drip irrigation, development of crop strains that provide 10 times higher yield with the same amount of water; pioneering work in drilling deep wells, sea and brackish water desalination technologies among others[15].

Figure 3.1: Policies for eco-innovation in Israel



As a result, Israel's agricultural production has been growing continuously, and the country exports approximately 80% of its products with the highest ratio globally in crop-yield/m3 of water.[16] Such supportive policies and programmes have also spurred growth in other key industries. For example, as of 2015, the country's clean tech industry already boasts over 600 companies across the three major sectors: water, energy, and environment.[17] Israel's environmental technologies export market is already worth approximately USD$1bn a year[18]

15/ Rejwan, A and Yaacoby, Y (2015) OECD Observer No 302, available online at http://www.oecdobserver.org

16/ Rejwan, A and Yaacoby, Y (2015) OECD Observer No 302, available online at http://www.oecdobserver.org

17/ Federation of Israeli Chambers of Commerce (2015) online at http://www.chamber.org.il

18/ OECD (2011) Policies to Support Eco-innovation in Israel, online at https://www.oecd.org

STI policy is particularly supportive of the innovation process, from idea generation to entry and diffusion into the market. STI policy has traditionally supported early stage research and development (R&D) for technological breakthroughs, and diffusion and outreach. STI policies receive priority attention in countries with economic growth strategies based on advanced technology. Over the last years, there has been an important shift in refocusing STI policies towards sustainability issues to accelerate the transition to green economy strategies[19].

The 11th Malaysia Plan is a recent example of green economy planning (see Box 3.2).

Public support for green innovation targets specific priority sectors such as water, energy and transport, and takes the form of direct R&D, grants to SMEs, facilitating the supply of risk capital for green technology development and diffusion, awarding innovation through prize and other recognition schemes, and support of demonstration projects in a late stage of development.

These policy actions are complemented by regulation and economic instruments such as subsidies to increase the adoption of greener technologies. Skills development is another critical area of STI policies.

An important shift in recent years has been a focus on demand-side innovation policies such as public procurement, standard-setting, and consumer policy to increase demand for green technological solutions. On this basis, SCP and STI framework represent two strongly complementary mandates which will benefit from cross-mainstreaming to support the effort of system innovation and change.

19/ OECD (2014) Science Technology and Industry Outlook, online at http://www.oecd.org

Box 3.2: **Malaysia's policies on SCP, STI and SMEs**

Malaysia's approach towards green growth is centred on the concept of sustainable consumption and production, which is clearly expressed in the 11th Malaysia Plan (Plan).[20] The Plan will chart Malaysia's direction for the next five years to reach developed nation status according to Vision 2020. It places a strong emphasis on innovation for sustainable development.

The Government of Malaysia has officially supported technology development in SMEs since the introduction of the Industrial Master Plan in 1986. The government formed the Innovation Agency in 2010 to be the vanguard for innovation in Malaysia and to assist local SMEs to move up the value chain through innovation. In addition, the SME Master Plan 2012-2020 has set an objective for Malaysia of becoming a high-income economy through the accelerated growth of SMEs supported by innovation and technology adoption. It is accompanied by the Technology Commercialisation Platform and Inclusive Innovation programmes.[21]

In 2010, the country established a Green Technology Financing Scheme amounting to RM1.5 billion (about USD 350 million). The scheme issues up to 60% credit guarantees for companies developing or using green technology. Other financial instruments include the Green Lane Policy for Innovative Malaysian SMEs. Its purpose is to ease the implementation of sustainable business practices through financial incentives such as loans at subsidised interest rates, tax exemption, and preferential treatment in government procurement. Malaysia is also developing environmental certification and labelling schemes that match international standards to set performance standards and verify compliance.[22]

20/ OECD (2014) Science Technology and Industry Outlook, online at http://www.oecd.org

21/ National SME Development Council (2012) SME Masterplan, online at http://www.smecorp.gov.my

22/ OECD (2014) Towards Green Growth in Southeast Asia, online http://www.iau-hesd.net

Designing and mainstreaming **policies to promote eco-innovation**

CHAPTER **FOUR**

This chapter explains the principles for designing and mainstreaming eco-innovation policy. Following these principles, a categorisation and non-exhaustive list of policies used for eco-innovation is presented. Case studies are used to demonstrate how instruments have been combined and implemented to address various issues in support of eco-innovation and SCP.

4.1 PRINCIPLES FOR ECO-INNOVATION POLICY

Systematic and long-term change through eco-innovation requires guiding principles for policy design and implementation. Overarching principles assist by guiding new policy development and revisions to policy when the policy environment changes. Policy principles draw on the eco-innovation approach of lifecycle thinking, strategic vision, value chain perspective and collaboration across key stakeholders.

The SCP approach underpins all economic and social processes and the transition to a resource efficient and green economy, integrating issues related to all business sectors, practices and market players.

The principles for eco-innovation policy can be summarised as follows:

- Practice policy integration
- Adopt lifecycle thinking
- Apply a value chain approach
- Foster collaboration for eco-innovation
- Adopt a long-term view

4.1.1 PRACTICE POLICY INTEGRATION

Most instruments directly related to eco-innovation can be easily located within national SCP frameworks. However, their success depends on effective linkages with other policy domains that are key to eco-innovation such as science and technology, innovation, and specific policies focusing on SMEs. This underlines the breadth of eco-innovation including non-technological forms of innovation and its potential to impact all sectors of the economy. Inter-ministerial coordination, including engagement of the national planning and finance ministries, is therefore important.

The SCP approach underpins all economic and social processes and the transition to a resource efficient and green economy, integrating issues related to all business sectors, practices and market players. By using this framework, governments can mainstream SCP into policy regimes to promote business eco-innovation and drive systemic change. China's Circular Economy Promotion Law is a recent example of mainstreaming SCP (see Box 4.1).

Mainstreaming SCP implies that each set of policy mandates for example economic development and environmental protection work in accordance, avoiding conflicting messages that would distort the market and address trade-offs between the economic growth and sustainability objectives. Coupled with a resourceful institutional set-up for implementation, and clear roles for each involved agency, integration would also drive coordination between various ministries and agencies. As such, it would also streamline the budget, removing redundancies, provide a common framework for assessing and evaluating progress, and identify specific areas where reinforcement is needed.

Eco-innovation is rarely an ultimate objective of policymaking. Rather, it is a means through which to engage and enable industries and businesses to contribute to the achievement of broader national goals related to development, competitiveness, employment, and the environment among others. Therefore, the combinations of policies for eco-innovation need to be strongly anchored in an overarching vision for the economy.

Box 4.1: **China – Integration of SCP policy into national frameworks**

SCP policy can directly affect or influence the promotion of eco-innovation in China through support for resources efficiency, cleaner production and waste reduction, energy security as well as policies to spur innovation in science and technology.

Different sets of policies and regulations have been developed under an overarching framework of the Circular Economy Promotion Law that aims to transform the country to a more sustainable development path, and the Mid and Long-term Plan for Science and Technology, which sets to transform China into an innovation orientated society by 2020 and a world leader in science and technology by 2050.[23]

The performance of China's innovation system is highly dependent on a combination of both vertical and horizontal communication, coordination and cooperation. At the macro level, the Central Government is instrumental in formulating the relevant policies and associated laws. The State Council designs policies and coordinates their implementation through the Leading Group for Science, Technology, and Education. Ministries devise further detailed and scaled policies. Local government plays an important role in enabling the development and operation of eco-industrial parks, eco-cities and business incubators focusing on environmental services.

23/ OECD (2009) Eco-Innovation Policies in The People's Republic of China, Environment Directorate, OECD; H. Lin, S.X. Zeng, H.Y. Ma, G.Y. QI, Vivian W.Y. Tam (2013) Can political capital drive corporate green innovation? Lessons from China. Journal of Cleaner Production 64, 63-72; Feng-chao Liu, Denis Fred Simon, Yu-tao Sun, Cong Cao., (2010) China's innovation policies: Evolution, institutional structure and trajectory, Research Policy 40 917-931

4.1.2 ADOPT LIFECYCLE THINKING

SCP and eco-innovation are strongly anchored to lifecycle thinking as it considers the impacts of industrial activities and their outputs holistically. Lifecycle thinking examines the impacts of goods and services over their lifecycle: from raw material acquisition through to manufacture, distribution, product use and disposal. It refers to a qualitative approach to understand how material resources flow through each stage of the lifecycle. It is closely linked to a scientific approach of lifecycle assessment but has been expanded to symbolise a system thinking and perspective in addressing issues of sustainability.

Water management in agriculture using water-saving technologies such as open irrigation drips © Eric Onyiego, USAID KIWASH

INSIGHT FROM **THE REEDTE PROJECT: KENYA**

EMBEDDING ECO-INNOVATION IN HIGHER ORDER POLICIES

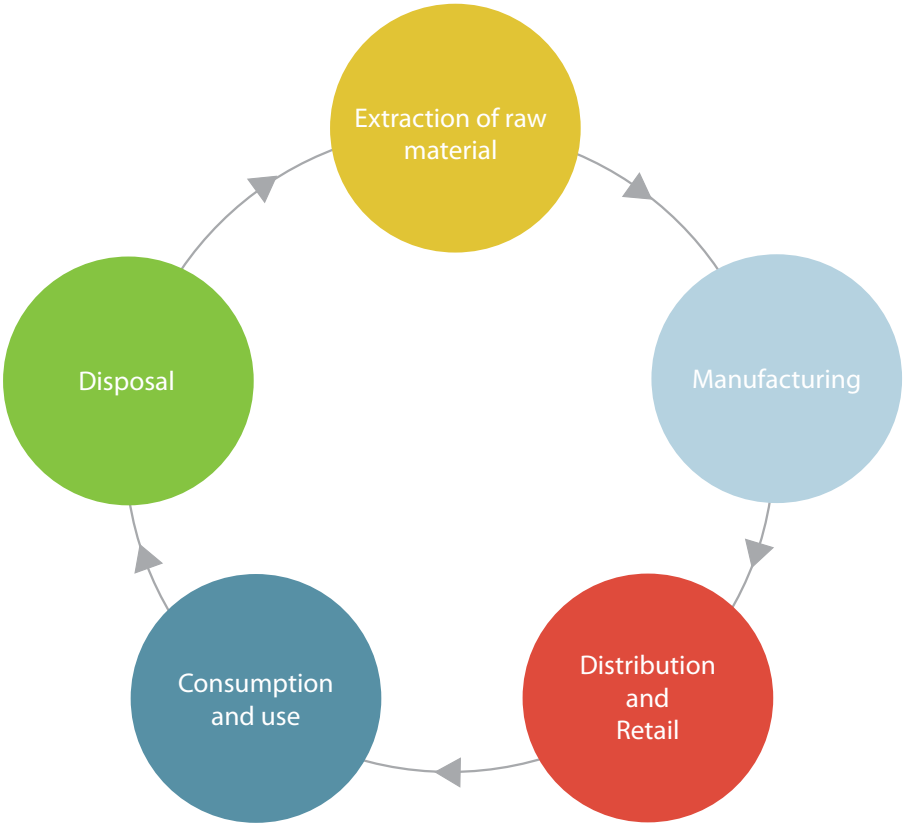
The implementing partners in Kenya, National Cleaner Production Centre of Kenya (KNCPC), reviewed a wide range of policies relevant to eco-innovation. KNCPC identified that the Constitution of Kenya supports the same objectives as eco-innovation. The KNCPC review noted:

'Kenya's Constitution of 2010 provides a roadmap in terms of a development that is ecologically sound. The Constitution places high premium on environmental conservation and spells out obligations in respect of specific natural resources, enactment of new legislations to prevent environmental harm as well as the human aspects of environmental management. Article 42 of the constitution recognises citizens' right to an environment that nurtures life and provides for human activities. Chapter 5 sets specific obligations that further guarantee Kenya's citizens improved environmental management and sustainable development.

Article 69 (g) commits the State to "eliminate" processes and activities that are likely to endanger the environment. Here a commitment is made to ensure that preventive environmental management is espoused throughout the lifecycle of products, processes and services. Policies and legislations therefore need to espouse the letter and spirit of this Constitution'.

As noted by KNCPC, eco-innovation policy can be more readily integrated in Kenya because the Constitution of Kenya, as a higher order policy, provides a strong framework within which SCP and eco-innovation can be mainstreamed.

Figure 4.1: Lifecycle thinking guides effective policy interventions over the whole product lifecycle



The value of lifecycle thinking lies in identifying interventions with the most positive impacts on sustainability. It achieves an overall net benefit on sustainability and avoids burden shifting, which seemingly solves one problem while creating another problem elsewhere. It prompts companies to consider the impacts their operations across their value chain going beyond their control boundaries, thus creating greater likelihood for significant systemic change. Figure 4.1 illustrates examples of how different policy instruments target different phases of the lifecycle of goods, which can be designed into policy combinations with interventions across the value chain. If applied at a macro level, it helps to identify specific issues, industries and value chains where actions are most urgently needed to efficiently target the efforts and investments of public and private sectors. Box 4.2 presents an example of the European Union (EU) policy package on the Circular Economy as an example of lifecycle application in policymaking.

Box 4.2: **EU Circular Economy Action Plan – building on lifecycle thinking**

The European Union's Action Plan for Circular Economy[24] is seen as the "evolutionary next step" after the EU Integrated Product Policy (IPP),[25] which offered a framework, guidance and a toolkit of instruments to encourage the continuous improvement of the sustainability performance of products at all stages of the lifecycle. The IPP contributed to a significant progress in the awareness and use of lifecycle thinking through key industries and policymakers,[26] and later became an essential part of the EU Action Plan on SCP/Sustainable Industrial Policy (SCP/SIP).

Like IPP and SCP, the EU Circular Economy Action Plan strongly builds on the whole economic cycle from production and consumption, to waste management, and markets for secondary raw materials. It emphasises resource efficiency and underscores the importance of "closing the loops" in value chains, so as to ensure all waste at the end of a value chain becomes a resource – with as much utility and value as possible – within a different process. The Circular Economy Action Plan is an economic and industrial policy developed and implemented jointly by Directorates-General for internal markets, industry, entrepreneurship and SMEs (DG GROW) and the Environment (DG ENV).

It includes the following set of policy measures: funding and economic incentives to promote more innovative and efficient ways of production and consumption, common measurement methodologies, quality standards for secondary raw materials, and eco-design measures to promote reparability and durability of products among others. It strongly builds on a revised legislative proposal on waste to set clear and ambitious targets for long-term economic transformation. The components of the EU Circular Economy Action Plan also include targeted initiatives on a few priority areas such plastics, food waste, construction and demolition, and critical raw materials at each step of their value chain.

According to a recent briefing by the European Parliament on the Circular Economy Action Plan, "it is estimated that the transition [towards a circular economy] would increase GDP by 1 to 7 percentage points by 2030",[27] depending on the pace of technological change. The Ellen MacArthur Foundation estimates that such a transition could allow €600 billion worth of savings in the EU by 2030.[28] Total benefits are estimated at €1.8 trillion per year, once multiplier effects are accounted for. The European Commission estimated that the adoption of the Circular Economy Action Plan would create over 170 000 direct jobs in the EU by 2035.[29]

24/ European Commission (2015) Closing the loop – an EU action plan for the Circular Economy, online at http://ec.europa.eu

25/ European Commission (2009) Report on the State of Implementation of Integrated Product Policy, online at http://eur-lex.europa.eu

26/ Rehfeld K-M. et al., (2004) Integrated Product Policy and Environmental innovations: An Empirical Analysis, online at http://www.sciencedirect.com

27/ European Parliament (2016) Closing the loop: new circular economy package, online at http://www.europarl.europa.eu

28/ Ellen Macarthur Foundation (2015) Growth within: a circular economy vision for a competitive Europe, online at https://www.ellenmacarthurfoundation.org

29/ European Commission (2015) Proposal for a directive of the European Parliament and the Council, amending Directive 2008/08/EC on waste, online at http://eur-lex.europa.eu

4.1.3 APPLY A VALUE CHAIN APPROACH

Eco-innovation focuses on how an individual business operates within a larger value chain. Using the boundaries of a value chain can help to break down the complexity of a system into a specific sub-system or unit within which a chain of actions can be delineated with the idea of affecting the decisions and interaction of market players in a way that would lead to more sustainable outcomes. As such, a value chain approach provides a useful framework for policy analysis and setting action.

The value chain approach draws attention to sector specific needs. Eco-innovation policy reviews may consider sector specific needs, as shown in the Kenya example (below). As the eco-innovation policy for water management in Israel (in Box 3.1) demonstrates, policy is designed to influence the entire value chain, from R&D to domestic industry and to the export of successful technologies. However, caution needs to be applied to ensure that sector specific policy does not perpetuate policy compartmentalisation, and that sector goals are aligned with the government vision and aspiration of towards a more sustainable direction. Focusing on value chains will need to be followed in combination with other principles described in this Chapter.

4.1.4 BUILD COLLABORATION FOR ECO-INNOVATION

Eco-innovation relies on an interactive process between different partners in the value chain and within a system for eco-innovation. Availability of interfaces for open and creative exchange and collaboration among stakeholders is essential to provide knowledge as input to eco-innovation and to mobilise the right competencies required for systemic change. Policy measures for eco-innovation should be formulated to encourage interaction and align the technical competencies of businesses and knowledge institutions.

The active involvement of stakeholders is important to facilitate social acceptance of changes and amplify the scale for eco-innovation through productive links across value chain actors and different sectors. Policy reviews for eco-innovation may encourage interaction and collaboration, as recommended in the Eco-innovation Project experience of Vietnam (see Insight section overleaf).

For example, facilitating collaboration between large and small companies, in which large companies comply with policies or programmes which encourage performance improvements among their suppliers, have been conducive for increased productivity and joint innovation.

Collaboration could also unfold in platforms to identify technologies to match needs with existing solutions, establish testing centres and business incubation hubs for networking, explore and generate ideas, and assess and avoid related risks. The public private partnership of the Finnish Industrial Symbiosis System provides an example of institutionalised collaboration between public and private sector (see Box 4.3).

Successful policy implementation requires action by various social actors – government, business, investors, consumers, researchers, educators and civil society– since eco-innovation has effects that go beyond businesses, extending to the broader society and the natural environment. Given these requirements, governments should convene relevant stakeholders for consultation and joint action to share the responsibility for transitioning into more sustainable consumption and production through eco-innovation and to distribute its benefits equally.

Maize production in Kenya © Neil Palmer, CIAT

INSIGHT FROM **THE REEDTE PROJECT: KENYA**

ANALYSIS OF SECTOR SPECIFIC POLICIES

To ensure strong coordination and integration with the Kenya's Green Economy Strategy and Action Plan (GESIP) to be launched in late 2016, the policy review process for mainstreaming eco-innovation focused on the same sectors as those prioritised by the GESIP. For example, the analysis of the policies governing the management of the agricultural sector in Kenya identified:

'that the agriculture policy provisions fail to bring up the concept of greening value/supply chains. In spite of a number of gaps and weaknesses, the breadth of policy provisions concerning agricultural sector gives immense opportunities for sustainable business practice'.

A number of specific opportunities were identified, of which a few are provided below:

Value chains: The policies in the agriculture sector emphasise the value addition in agricultural commodities. Although not currently provided, opportunities are therefore presented to green these value chains from sustainable land management practices, processing, product innovation and to developing new markets.

Sustainable land management: Opportunities are also presented in the improvement of sustainable land use and environmental conservation through soil and water conservation programs, reclamation of land, and water harvesting technologies. Elaboration of concepts such as an ecosystem-based approach in the management of natural resources, smart irrigation technologies, and value addition among others, are required so that players can be prepared to implement them. Elaboration can take the form of additional policy provisions, regulations and guidelines.

Climate-smart agriculture: The policy provides opportunities for climate-smart and resilient agriculture that reduces climate vulnerability and greenhouse gas emissions while raising productivity. Entry points for eco-innovation can be, for instance, in the ongoing and planned irrigation activities through application of a more intelligent approach to water management such as deploying precision irrigation systems. Eco-innovation will also require a change in mindset on the importance of measuring and forecasting. Agroforestry is also another strategy that will not only enhance food security and improve farmer's livelihoods, but also contribute towards more forest cover. There is need for adequate provisions to incentivise players in the financial sector to develop financing and insurance packages to support smart agriculture by farmers.

Sustainable consumer choices: It is necessary to make consumer food choices easier through informational product labels. This goes hand in hand with the efforts of retailers and food companies to invest in local supply chains. It will also be important to facilitate collaboration between food system actors through agreements among retailers to establish codes of conduct. If these actions are coupled with the creation of education programs on the links between natural resources, consumption patterns and health, it would stimulate local as well as regional sourcing and investment in sustainable local supply chains.

Capacity building: The proposed changes in the agriculture policy provisions have far-reaching consequences for capacity building needs for government, other stakeholders and institutions including farmers, on climate smart agriculture and greening supply chains. For the policymakers, capacity building to adapt policies to adequately respond to changing climatic conditions and market realities is essential. More personnel need to be trained and deployed to provide extension services to farmers and manufacturers in value addition at production, processing, product development, packaging and marketing. The research–extension–farmer linkages will facilitate demand-driven research and increase use of improved technologies.

Box 4.3: **Lessons learned from building collaboration for industrial symbiosis in Finland**

In 2013-14 SITRA, the Finish Innovation Fund, together with the Finnish Ministries of Employment and Economy and the Environment funded a research project on industrial symbiosis, which then has become a Finnish Industrial Symbiosis System. It is an operational model to provide a systematic way for companies and other organizations to create partnerships and new business opportunities through more efficient use of raw material, technology, services and energy.

Collaboration initiated and facilitated through public support was a key aspect of the project which aimed:

- Build a facilitated industrial symbiosis approach suitable to be implemented in Finland;
- Train and support organizations in the regional delivery;
- Identify opportunities for eco-innovation leading to investment opportunities for SITRA or other financiers.

Motiva, a public company, is now a designated delivery body as part of a public-private partnership established to support the operation of FISS. It is a nationally coordinated, regionally delivered programme (using a multi-stakeholder approach including actors from Government, large and small businesses, academia and entrepreneurs), receiving investment through the Finnish Government. It is seen as an important tool in regional development and economy. As of 2016 around 600 companies where involved in FISS which led to 2,400 identified opportunities for synergy concerning 4,300 resources.

Many of these companies are now working in an industrial symbiosis saving operational costs, creating jobs and giving their business performance a boost.

In the end of 2016 12 regions are involved covering more than half of the area of Finland. The plan for the future is to have all Finnish regions engaged in the programme involving at least 1000 companies that will form synergies and help move the country towards the circular economy. FISS is identified as one of the important activities in the Roadmap for Circular Economy for Finland, adopted in September 2016.

Ämmässuo eco-industrial park in Espoo, Finland. © Helsinki Region Environmental Services Authority (HSY)

INSIGHT FROM **THE REEDTE PROJECT: VIETNAM**

The Vietnam policy partner, Asian Institute of Technology – Vietnam, developed a stakeholder engagement strategy as part of the review of eco-innovation policy. A desktop study was the first step to assess policy for eco-innovation. A desktop study is insufficient to make a change in the policy settings. Engagement with stakeholders is a vital step to building understanding, trust and support for eco-innovation and the necessary policy change.

Drawing on evidence from the eco-innovation policy review for Vietnam, stakeholder engagement occurred through a structured process with workshops and interviews. The stakeholder engagement process followed a sequential process in the Vietnam policy review, as illustrated in Figure 4.2.

Figure 4.2: Stakeholder engagement process used in the review of Vietnam's eco-innovation policy

The stages were:

Desktop Study: Reviewed the current policies and strategies, action plans and initiatives at the national and local levels with relevance to SCP and Eco-innovation at SMEs.

First Consultation Workshop: A preliminary report of the Desktop Study was presented at the Consultation Workshop to get comments from experts and administrators on the policy status of SCP, how it is supportive to SMEs and the gaps and barriers to SMEs' eco-innovation, and their root causes.

Interviews and Meetings: Individual discussions were held to identify: (1) the gaps in existing SCP related policies/supporting programs; (2) the challenges faced by SMEs in addressing out eco-innovation and (3) the root causes of the gaps from the point of view of involved stakeholders.

SCP Policy Context Gaps Analysis: The data from (1), (2) and (3) was analysed to identify the gaps in existing policies and the barriers for eco-innovation implementation at SMEs. Based on that, recommendations and actions were proposed to promote and implement a SCP and eco-innovation program nationwide.

National level validation workshop: The workshop was conducted with relevant stakeholders from government and private sectors to validate the study's findings/recommendations and identify actionable steps to implement a national eco-innovation program nationwide.

Overseeing the stakeholder engagement process was a Steering Committee (SC) using an existing participatory inter-agency mechanism. Competent government authorities were full members of the SC. The main role of the SC was (1) to provide support and guidance relevant for the project implementation; and (2) to review and provide comments on the deliverables, including preliminary mainstreaming reports and the roadmap for implementation of recommendations. They also led the discussion at the national level validation workshop, and presented the policy mainstreaming report towards the agreement on recommendations and development of the Roadmap for Action.

4.1.5 ADOPT A LONG-TERM VIEW

Measures aiming at short-term reductions and improvements only result in incremental changes favouring sub-optimal levels of sustainability. Measures that do not provide a clear and coherent path to address long term issues such as increasing vulnerability from environmental and resource degradation and resource scarcity will not be effective in mitigating against these risks.

Policymaking needs to have a long-term strategic vision to show the direction in which the regulatory landscape is heading beyond the current election term. This is necessary not only to secure a form of sustainability based on the concept of intergenerational equity, but also for industry to have the clear signals to show them that investing in eco-innovative solutions is worthwhile.

Eco-innovation is implemented by market agents who need a stable environment to take risk and a clear direction on where to focus for continuous improvement. Long-term orientation is an important frame of reference for decisions and collective actions30 and results can be seen in success of Germany's energy transition (Box 4.4). Long term orientation means that at the top level of the decision-making hierarchy are early adopters and believers in a paradigm shift –this can be a fundamental factor for success.

The measures should focus on building and communicating a long-term strategy for national development which address pressing social and environmental issues. This principle also prompts thinking about creating and continuously improving a system for the development of strategic intelligence through independent research with corresponding investment in R&D and education. Selected measures need to be regularly reviewed to ensure their relevance, and their stringency increased overtime to push the market towards continuous improvement.

Box 4.4: **The energy transition of Germany**

In 2010, policymakers in Germany took the fundamental political decision to move towards a sustainable energy supply over the long-term, by establishing the principles of an integrated energy transition pathway towards 2050, and determining renewable energy as the cornerstone of future energy supply.31 These broad and ambitious goals have provided a long-term signal and predictable framework to accommodate a range of policies and instruments to ensure sufficient flexibility to adjust to any technical and economic development. This has resulted in investor confidence and security, providing many incentives for eco-innovation.

According to the Heinrich Böll Foundation, a German think tank for environmental policy reform, 'the energy transition boosts green innovations, creates jobs and helps Germany position itself as an exporter of green technologies'.[32] The transition has indeed led to a considerable increase of Germany's share of renewable power from just 6% in 2000 to over a third in 2015.[33] One of the key principles of the scheme used to be the 'feed-in tariff', a remuneration above market rates paid to renewable energy producers, which provided them with long-term security and contributed towards accelerating Germany's renewables growth. In July 2016, the German Renewable Energy Act was reformed to introduce market-based elements in the system. As of January 2017, payments to renewables installations will be determined in a competitive process, through auctions, instead of being fixed by the government.34 Only installations that have won an offer will receive payments for the power they supply. Small installations under 750kW will however, continue to receive feed-in tariffs. The government expects to raise the economic efficiency and affordability of renewable energy by encouraging innovation and competitiveness.

30/ OECD (2015) System Innovation: Synthesis Report, online at https://www.innovationpolicyplatform.org

31/ International Energy Agency (2013). Energy Policies of IEA countries. Germany 2013 Review. Executive summary and Key Recommendations; and Hascic, I. (2012) Environmental innovation in Germany, OECD Environment Working Papers, No. 53, OECD Publishing

32/ Heinrich Böll Foundation (2012) Energy transition: stimulating technology innovation and the green economy, online at https://book.energytransition.org

33/ DW (2016) Sea change to Germany's energy transition as it throws renewables to the open market, online at http://www.dw.com

34/ Wire (2016) EEG Reform 2016 – switching to auctions for renewables, online at https://www.cleanenergywire.org

4.2 POLICY INSTRUMENTS FOR ECO-INNOVATION

Policymakers have a toolkit of policy instruments at their disposal to develop and implement a balanced and comprehensive strategy for eco-innovation. These instruments have associated strengths and limitations, while their effectiveness may depend on the context and time of intervention. One instrument on its own may not be sufficient to lead to a significant change. What makes them systemic in their impact is the way in which they are combined and designed to address systemic issues and barriers, all of which are complex nature.

Building on earlier UN Environment publications,[35] five categories of policy instruments for eco-innovation are described below:

- Regulatory instruments
- Economic instruments
- Information-based instruments
- Voluntary instruments
- Behavioural instruments

The classification reflects the differences in mechanisms to create incentives, benefits and costs that they impose on companies and society. In the following sections, each instrument type is illustrated with relevant examples and their strengths and limitations for contributing to eco-innovation policy are identified.

Two things are important to note. Firstly, the effectiveness of policies depends largely on their design and combination. The policy mix is dependent on context in terms of knowledge base, the size of the market, industrial structure and the development of specialized business and financial intermediaries.

Secondly, no clear border exists between these categories of policy instruments. Some of the instruments referred to will contain elements from one or more of the other categories, and the actual classification will depend on local circumstances. The policy instrument, Extended Producer Responsibility (EPR), provides a good illustration of this: when enforced by law it may be considered a regulatory instrument whereas in other cases it is rather seen as an economic or even a voluntary instrument.

35/ UN Environment (2013) Sustainable Consumption and Production- A Handbook for Policy Makers 2nd Ed., online at http://www.switch-asia.eu

INSIGHT FROM **THE REEDTE PROJECT**

A PROGRAM FOR POLICY REVIEW AND ANALYSIS FOR ECO-INNOVATION

Review and analysis of existing policy settings will inform any policy initiative for eco-innovation. The review provides an opportunity to undertake a reasoned analysis of the country's context, the opportunities for government support of eco-innovation, and recommendations for next steps for policy action. The results of the policy review will inform and develop policy settings to promote eco-innovation.

The specific outputs of this activity are to include, but not be limited to, a report on the opportunities for mainstreaming of policies for eco-innovation within the country. The report should evaluate the national context and government readiness for eco-innovation, conduct an inventory of policies which affect eco-innovation, identify areas of opportunity to improve the policy environment overall, and in particular sectors, identify ready actions which can be undertaken by government.

A recommended template with Terms of Reference for the activity as well as for report structure is provided in Annex 1. This has been developed through a comparative analysis of the four policy review reports from the national level activities of the UN Environment REEDTE Project, undertaken by the implementing partners in Colombia, Kenya, Peru and Vietnam.

4.2.1 REGULATORY INSTRUMENTS: COMMAND AND CONTROL

Regulatory instruments can mandate or prohibit specific practices or define a level of environmental performance to be achieved. They are usually combined with a monitoring mechanism and sanctions for non-compliance. By providing a level playing field for the industry, they reduce uncertainty and send clear signals to the market on where to set priorities. They in effect work by forcing behavioural change.
By setting appropriate stringency levels and applying life cycle thinking, regulatory policy instruments can push towards change:

Substance bans or restrictions can stimulate new markets for alternative eco-innovation solutions which companies cannot otherwise create on their own. Standards and regulation can also provide advantages to frontrunners who anticipate trends and innovate accordingly.

By providing a clear signal across the market, regulatory instruments can also help connect various parts of the system towards a common direction of change. As the example from Box 4.5 demonstrates, the ban on plastic bags created joint action from retailers, waste managers, consumers and entrepreneurs to find and diffuse alternative solutions and adjust their behaviours.

The effectiveness of regulatory instruments can be greatly improved by combining them with other types of instruments. In principle, they work inherently well with all other types. For example, a ban on certain types of products or setting high minimum standards for pollution would only be impactful if coupled with measures such as capacity building for SMEs and support for R&D to develop innovative alternatives.

© Women wash plastic bags before fed into machines for recycling, Apophia Agiresaasi, GPJ Uganda

Figure 4.3: Examples of regulatory instruments

Table 4.1: **Strengths and limitations of regulatory instruments**

Strengths	✔ Can be very effective in solving identified issues, especially when they are properly enforced ✔ Have a clear policy goal, which allows for effective monitoring and evaluation
Limitations	✔ Establishing the right mechanism for enforcement is critical and can be expensive ✔ Can be perceived as static and rigid imposing the same compliance for different types of companies

Box 4.5: **Policy innovation case study – plastic bag ban in Rwanda**

To fight the serious environmental impacts of the high quantities of plastic bags littering the country, Rwanda banned the manufacturing, use, importation and sale of all non-biodegradable polyethylene bags in 2008. It was an innovative policy as no other country had done it before, though some were considering a tax on single-use plastic bags. Today, all visitors travelling to the country either surrender their plastic on aircraft before landing or have it confiscated.[36] In supermarkets, where plastic bags were widely used many years ago, customers are now given paper bags.

This law has had positive environmental, social and economic impacts. Plastic bags are no longer clogging drains, floating around cities, littering farms and rivers, or releasing toxic fumes when burned in landfills. The country has enjoyed a considerable increase in tourism in the country: over a million tourists visit Rwanda each year. This has in turn had social benefits, since 8% of jobs in Rwanda are in the tourism sector. The initiative has also reduced public spending dedicated to cleaning up plastic waste. The risks and costs linked to flooding, often caused by clogged drains, have also decreased.

The law has also fostered sustainable innovation in the country, providing new business opportunities for entrepreneurs who produce viable alternatives to plastic bags, made with biodegradable materials, mainly paper. A Rwanda paper bag industry emerged after the government abolished plastic in the country. Several paper bag companies are now competing to provide solutions for changing market in the country, and generating hundreds of new jobs.

After the ban, illegal smuggling of non-biodegradable plastic became a lucrative business.[37] In response to illegal smuggling, authorities seize plastic bags and offenders are fined and can be sent to jail for up to 12 months. Through tax incentives, the Rwandan government has encouraged plastic bag manufacturers to start recycling them instead, for authorised uses, for example the collection and transportation of disposed of bio-medical wastes, or green houses.

The ban on plastic is part of Rwanda's Vision 2020,[38] which aims to transform the country into a sustainable middle-income nation. For now, the ban only applies to one type of plastic – polyethylene. However, there are plans to extend it to other types of plastic, and eventually to lead by example to show that a plastic-free country is possible.

36/ Clavel, E. (2014) Think you can live without plastic bags? Consider this: Rwanda did it, online at https://www.theguardian.com

37/ Al Jazeera (2016) Smugglers work on the dark side of Rwanda's plastic bag ban, online at http:\america.aljazeera.com

38/ Rwanda Development Board (2000) Rwanda Vision 2020, online at http://www.sida.se

4.2.2 ECONOMIC INSTRUMENTS: SENDING PRICE SIGNALS

Economic instruments are most commonly used to adjust market prices so that environmental and social costs are internalised in the prices of goods and services (based on the 'polluter pays' principle).

Several mechanisms can enable better economic incentives for companies to adopt sustainability in their core business strategy and help to stimulate the market demand for sustainable products and business practices – hence providing opportunities for eco-innovative companies.

Economic instruments reward companies pursuing sustainable and competitive alternatives with an advantageous cost and revenue structure, thus encouraging them to move beyond compliance. They are particularly effective in promoting continuous change which important for eco-innovation and the scaling up of eco-innovative business models throughout the market:

Green or Sustainable Public Procurement (SPP) can stimulate and steer market demand for sustainable products. In some developing countries, public purchase amounts to 10%-15% or more of the country's GDP[39].

39/ World Trade Organization https://www.wto.org/english/tratop_e/gproc_e/gproc_e.htm

In this respect, government has considerable purchasing power and can create significant market demand for products and services derived from eco-innovation. To meet the criteria, the implementation of SPP needs to be accompanied by information based instruments, such as guidelines on sustainability criteria for procurement authorities and eco-labelling schemes, as well as capacity building for SMEs so that the criteria can be met.

Extended Producer Responsibility (EPR) passes a significant financial and physical responsibility to product manufacturers for the treatment or disposal of post-consumer products. In principle, EPR provides economic incentives to prevent waste at the source and promote the integration of life cycle thinking and circular economy based business models. The scheme rewards those eco-innovative companies that are ahead of the curve.
Equity support measures include financial instruments such as specialized venture capital funds that provide seed capital, green funds to guarantee bank loans for investment projects, and investment guarantee funds that target intermediary financing activities between loans and equity. Equity measures can also enable funds for the diffusion of eco-innovative solutions so that companies can avoid the risk of failure. They can support start-ups and green entrepreneurial firms. Given that eco-innovation may require upfront investment and long payback periods, these measures are particularly relevant for motivating and supporting business embarking on eco-innovation.

Figure 4.4: Examples of economic instruments and strategies

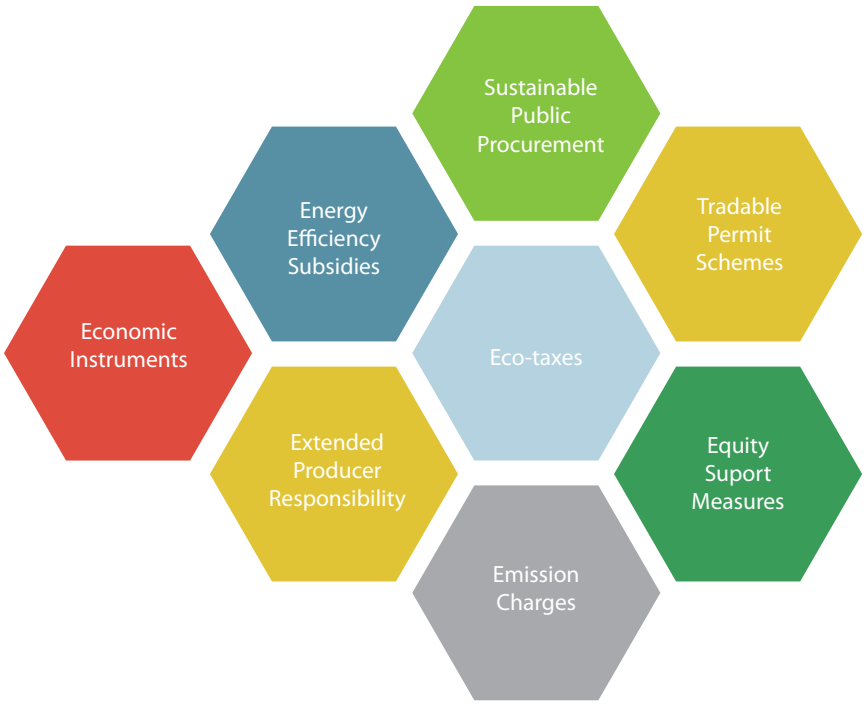


Table 4.2: **Strengths and limitations of economic instruments**

Strengths	✔ Encourage businesses to change beyond compliance and engage the market in a transformed and more sustainable way. ✔ More dynamic than regulatory instruments and more cost effective to implement. ✔ Can generate revenue for the government through taxes to be reinvested into other policy initiatives and public projects.
Limitations	✔ Require adequate effective competencies for design, implementation and enforcement. ✔ Need to set the correct level of taxes and charges to provide right incentives. Monitoring is thus important but challenging.

Box 4.6: **Circular economy policies to promote repair of products**

In 2016, the Swedish government proposed tax breaks on repairs for various consumer goods items as a way of encouraging the efficient use of natural resources. Under the proposed changes, the value-added tax (VAT) on the repairs of items like bicycles, shoes, leather goods, clothes and household linen would be reduced from 25% to 12%, and would accompany a measure to allow consumers to claim back half of the labour costs for the repair and maintenance of white goods like fridges and washing machines from their income tax.

In 2015, more than 58,000 tonnes of white goods were collected as waste in Sweden, and the government is hopeful that the move will stimulate the Swedish repair industry, despite the estimated cost to government of around $85 million in lost tax revenue.[40] The government hopes that by providing tax credits, labour costs on maintenance would be reduced and consumers would have greater incentive to repair their products instead of buying new ones; thus, contributing to a more circular economy in the country. Another aspiration of the tax break on appliances is that it will spur the creation of a new home-repairs service industry, thus providing more jobs. [41]

This is in line with one of the European Commission's Circular Economy package which encourages member states to provide incentives and use economic instruments (e.g. taxation) to move towards a more circular economy. Other countries are using similar policy instruments to promote a more circular economy culture among consumers and manufacturers alike.

In 2011 for example, China introduced new incentives by totally or partially exempting numerous products and processes from VAT if they were made from reused, recycled, or repaired products. These ranged from woven fabrics to building materials, and provided tax exemptions or reductions for services related to such products.[42]

40/ Resource (2016) Sweden planning tax breaks on repair to boost Circular Economy, online at http:\resource.co

41/ The Guardian (2016) Waste not want not: Sweden to give tax break for repairs, online at www.theguardian.com

42/ Mathews, J.A. and Tan, H (2016) Circular Economy: Lessons from China, Nature, online at http://www.nature.com. Dezan Shira & Associates (2011) China expands tax incentives to promote circular economy, China Briefing, online at http://www.nature.com

Environmental subsidies, such as energy-efficiency subsidies, make the sustainable option financially more attractive. To avoid market distortion, a phase-out strategy should be developed, changing the framework conditions in which subsidies are no longer needed.

Grants and prizes for R&D can help SMEs to invest in and build their capacity to find eco-innovative solutions rather than focusing on technology transfer and imitation. Such measures should be used in conjunction with building the education and training capacity necessary for R&D.

Tax incentives, as described in Box 4.6, can encourage a culture of repair and recycling particularly in developed countries with high tax bases. For developing countries with large informal economies, tax incentives may be less effective than other economic instruments.

4.2.3 INFORMATION-BASED INSTRUMENTS: ENABLING INFORMED CHOICES

Information-based instruments are intended to provide information on the environmental and social impacts of products and business operations to both producers and consumers. Consumers range from small individual consumers through to large procurers and retailers, investors and government. Information-based instruments intend to encourage behavioural change by revealing the real costs of pollution and the potential for savings to producers, and by helping consumers to make informed choices.

Most of these instruments represent the demand side of the market and thus can play a powerful role in stimulating a supply side response by way of more sustainable solutions. They are also educational and learning instruments that facilitate learning and improved accountability:

Corporate Sustainability Reporting (CSR) targets public disclosure of information about the 'non-financial performance' of a company and is an important mechanism to improve the transparency of corporate culture. National government reporting encourages environmental performance, as demonstrated by Sri Lanka's Haritha Lanka plan (see Box 4.7).

Product sustainability information such as eco-labels or Environmental Product Declarations (EPD) aim to provide relevant, verified and comparable information about the environmental and social impact of goods and services. Each has its own user depending on the need for the level of information, but importantly, they are life cycle based. Stimulating companies to address impacts beyond the company and along the value chain, strongly correlates with the eco-innovation idea. Combined with sustainable supply chain or procurement policies they can provide the necessary information and criteria for purchasing decisions, which would in turn differentiate eco-innovative companies.

Figure 4.5: Examples of information-based instruments

Table 4.3: **Strengths and limitations of information-based instruments**

Strengths	✔ Governments are uniquely positioned to provide a central and authoritative source of information and providing information online can be inexpensive ✔ Consumer education is an essential to achieve sustainable consumption
Limitations	✔ Success depends on the actual behavioural change of the target group, who are also influenced by other factors, such as regulation and economic circumstances ✔ The development of national information based approaches require effort for harmonization to align criteria and reduce transaction costs for business

Information-based instruments represent soft measures unless they have been made legally binding. Therefore, they are more effective if supplemented by other policy instruments. Eco-labels for example have been successfully used in concert with SPP or energy efficiency subsidies to show conformance of products with the set sustainability specifications. SPP has the potential to be one of the most powerful approaches to support eco-innovation.

4.2.4 VOLUNTARY INSTRUMENTS: SETTING THE CONTEXT FOR SUSTAINABILITY

Voluntary instruments are flexible and cost-effective initiatives from a policymaking perspective as they give producers the choice to decide how best to achieve goals with little or no 'policing' by the state. Voluntary instruments provide a more collaborative and conducive context for businesses to adopt sustainability. Some approaches are based on obtaining commitments by firms to improve their sustainability performance, often beyond what is legally required.

Voluntary initiatives are based on the spirit of constructive and consensual cooperation between state and business, which can lead to changes in the values and behaviour of both sides. It encourages better collaboration between firms and improves the flow of information and knowledge. Therefore, they can enable knowledge for eco-innovation to be shared both at firm and value chain levels:

Box 4.7: **National Green Reporting System in Sri Lanka**

Sri Lanka's Haritha Lanka seven-year plan includes a green reporting system.[43] The development of the reporting system was a collaborative effort between many stakeholders, managed by the National Council for Sustainable Development with strong involvement from the private sector through a business intermediary such as the Ceylon Chamber of Commerce.

Based on principles from the ISO 26000 guidance on Social Responsibility, the green reporting system comprises 50 environmental, social and economic indicators. There are special provisions to stimulate SMEs to participate in the process. Enterprises can associate themselves with the reporting system in different tiers according to their size and capability. Thus, a smaller company can choose to associate itself with only one or two tiers, allowing more time and training and fewer indicators to report on. Since the launch of the system, almost 100 enterprises have presented their reports. Together with other national service providers, such as the Industrial Technology Institute (ITI), the Sri Lanka National Cleaner Production Centre is involved in awareness raising and general training of enterprises on green reporting.

43/ Government of Sri Lanka (2009) National Action Plan for Haritha Lanka Programme, online at http://www.environmentmin.gov.lk

Schemes promoting voluntary regulation include company-level auditing and management schemes that can be conducive in increasing organizational capacity for environmental compliance, quality, and process safety among other things. Examples of these are the EU Environmental Management and Audit Scheme (EMAS), ISO 14001 or Business Social Compliance Initiative[44], and Voluntary Agreements in Chile (see Box 4.8 below).

Voluntary public private partnerships with governments and businesses participation can set up the enabling infrastructure for eco-innovation. Public private partnerships enhance the environment for cooperation and collaboration by creating a sense of shared ownership and establishing proactive roles for these actors to reach common sustainability objectives.

Value chain clustering, which can include zoning and planning efforts such as eco-industrial parks and/or trade zones, are voluntary schemes often facilitated by governments that can foster more productive links between firms for industrial symbiosis and along closed-loop models of production.

44/ Business Social Compliance Initiative is an auditing system developed by European retailers to improve social imperatives in the supply chains. It contains two levels. Conformance with the first level is compulsory (minimum working conditions and social standards), while the second is voluntary. BSCI is not a certification scheme but a monitoring system http://www.bsci-intl.org/

Eco-innovation can be set as a vision for such clustering to move multiple actors in the same direction of innovation.

Supply chain initiatives are company level programs aiming to transfer and disseminate practices through the entire supply chain by using the relationships between large buying firms and their suppliers. In the context of 'greening supply chains' these initiatives have the potential to increase the technical capacity and network for suppliers, thus enabling them to adapt to life cycle thinking and interact with value chain partners.

Training and capacity building initiatives are necessary to build competencies in companies to carry out necessary changes, especially for SMEs which often lack the information or knowledge required to fully implement eco-innovation. Schemes can involve stepping up the interaction between research institutes and SMEs as well as enhancing the capacity of these institutes, including in-country technical consultancy experts, to provide tailored services to implement eco-innovation in companies.

Knowledge networks or platforms intend to create a multidisciplinary, collaborative environment for disseminating insights into available technologies and solutions as well as establishing partnerships with other value chain actors. Open-source platforms and 'common' licenses encourage sharing and re-skilling for eco-innovation. They are particularly beneficial if they enable easy access and the participation of SMEs, thus helping them to improve their absorptive capacities.

Figure 4.6: Examples of voluntary instruments

Table 4.4: **Strengths and limitations of voluntary instruments**

Strengths	✔ Enables motivated first-movers to demonstrate sustainability performance and reliability ✔ Flexible and cost effective strategy for industry to prepare or mitigate the need for government regulation
Limitations	✔ The effectiveness depends on the level of commitment of the management of the company. If limited, then ambition level may be low ✔ There are no penalties for non-compliance

Voluntary instruments have been increasingly popular in the last decade and have shown to be an important driver to pioneer initiatives and for scaling sustainability practices across the business sector. Voluntary instruments should be integrated into a broader public policy agenda and regulatory framework that set ambitious performance targets and include monitoring and sanctions, as well as provide opportunities for greater public scrutiny.

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Box 4.8: **Voluntary Agreements in Chile**[45]

The Cleaner Production Council (CPL) in Chile facilitates voluntary agreements (VA) with various governmental institutions and industry associations. To date, about 6,000 companies have been impacted. The VA with the tyre industry in Chile offers a good example.

Previously, there had been a very low rate (about 5%) of treatment and recovery of used vehicle urban tyres. When an EPR law was being developed for a group of products, 10% of which were tyres, the CPL approached the Chamber of Tyre Industry (CINC). It became clear that the CINC still needed to create a take-back and recovery system for tyres and promote clean production strategies in the industry.

A voluntary agreement was developed to address these issues. An important element of this agreement included the search for markets for products recycled from tyres granules. It was foreseen that these tyre granules could be used, among others, for parks and soccer fields, as well as be incorporated into road-base. A recovery centre was established to recycle tyres. Since the agreement came into force, there has been a recycling rate increase to 23% - from approximately 480 tonnes to 9,000 tonnes in 2013.

The EPR regulation served as a push factor, with the VA used as a complementary instrument supporting implementation of the regulation.

45/ Interview with a representative of the National Cleaner Production Centre, Chile

4.2.5 BEHAVIOURAL INSTRUMENTS: NUDGING SUSTAINABLE BEHAVIOUR

Behavioural instruments provide a non-regulatory way to influence human behaviour towards more sustainable choices. Essentially it is a demand-side instrument and can be effective in promoting eco-innovation. A policy innovation itself contains elements from cognitive psychology, behavioural economics, and cultural studies. Behavioural instruments aim to understand the fundamental drivers for behaviour and use these to encourage consumers to change consumption behaviours, which can also create a stronger market demand for sustainable and innovative solutions.

Understanding human behaviour and influencing it towards more sustainable options can be a powerful way to enable the paradigm shift. Social norms are often the key barrier to environmental sustainability and eco-innovation. Behavioural policy approaches can therefore be an effective complement to the policy set:

Nudging is about giving people and businesses prompts to act sustainably. For example, simply removing trays at a self-service restaurant on a university campus reduced the size of portions, which led to a decrease of 50% in food waste.[46]

Default options are a type of nudging. When the more sustainable choice is the default option, sustainability is normalised.

For example, not giving plastic bags to shoppers unless they ask for one has shown to have positive effects.[47]

Actionable feedback to consumers: the way the information is presented to people about their performance can be effective in a way that encourages action. For example, some energy companies started displaying on the customer's utility bills a comparison of their energy use with that of their neighbours, which contributed to significant reduction in energy consumption.

Collaborative consumption encourages solutions whereby people collaborate in using good and services as a group, which significantly reduces resource intensity compared to cumulative consumption resulting from individual use. Policy can encourage this through development of shared spaces, such as centralised meeting places for social services, recreation, and SME and micro-enterprise hubs.

Behavioural instruments complement information-based instruments by enabling information to trigger actual change in consumer behaviour. Behavioural instruments need to be reinforced by a 'supporting infrastructure' that enlivens the options for change.

For example, the Velib scheme of bicycle sharing promotes change through behavioural instruments while offering a sustainable alternative (refer Box 4.9).

46/ Umpfenbach K. (2014) Influence on Consumer Behaviour: Policy Implications Beyond Nudging, online at http://ec.europa.eu

47/ Umpfenbach K. (2014) Influence on Consumer Behaviour: Policy Implications Beyond Nudging, online at http://ec.europa.eu

Figure 4.7: Examples of behavioural instruments

Table 4.5: **Strengths and limitations of behavioural instruments**

Strengths	✔ Helps to understand the underlying factors for human behaviour and make other policy interventions more effective. ✔ Targets change in social norms and consumer patterns that can help to steer market opportunities for eco-innovation. ✔ Can be disseminated rapidly using information and communication technology.
Limitations	✔ Perceptions of covert influence creates a need for sensitive and ethical consideration before policy action. ✔ The impact of behavioural instruments on consumer choice will be limited where consumer choice is limited.

Box 4.9: **Bicycle-sharing programmes to encourage sustainable public transportation**[48]

Changing behavioural patterns can steer market demand and shift consumer needs, which creates market opportunities for eco-innovation. For example, through the provision of government support for product service systems such as sharing schemes, consumers see the benefits of using service based models.

The Velib bicycle-sharing programme, launched in 2007, aims to promote sustainable transport in the city of Paris, France. A public-private partnership - the municipality collaborated with an advertising firm – was used to establish what has become one of the largest bicycle sharing programmes in the world. Since the launch of the system, the number of cyclists on the streets had risen to 41% and more than one out of every three bicycles on the streets of Paris is now a shared bicycle.

Bicycle sharing has rapidly gained popularity around the world, with more than 500 cities in 49 countries currently hosting advanced bicycle-sharing programmes. From Mexico City (Mexico) to Dubai (United Arab Emirates) and from Montreal (Canada) to Hangzhou (China), cities have turned to the bicycle as a way to enhance mobility, alleviate congestion, reduce air pollution and boost health. In addition, it has spurred local business development through the manufacturing and maintenance of bicycles and parking stations and other extension services needed to operate the system.

By providing a widespread, affordable and convenient infrastructure for the use of bicycles, the Velib system has prompted citizens to easily switch to a more sustainable model of mobility leading to a host of other benefits.

48/ Larsen J., (2013). "Bike-sharing Program Hits the Streets in Over 500 Cities Worldwide" Plan B Updates of the Earth Policy Institute and BIO Intelligence Service (2012). Policies to encourage sustainable consumption, Final report prepared for European Commission (DG ENV)

4.3 IMPLEMENTING ECO-INNOVATION POLICY

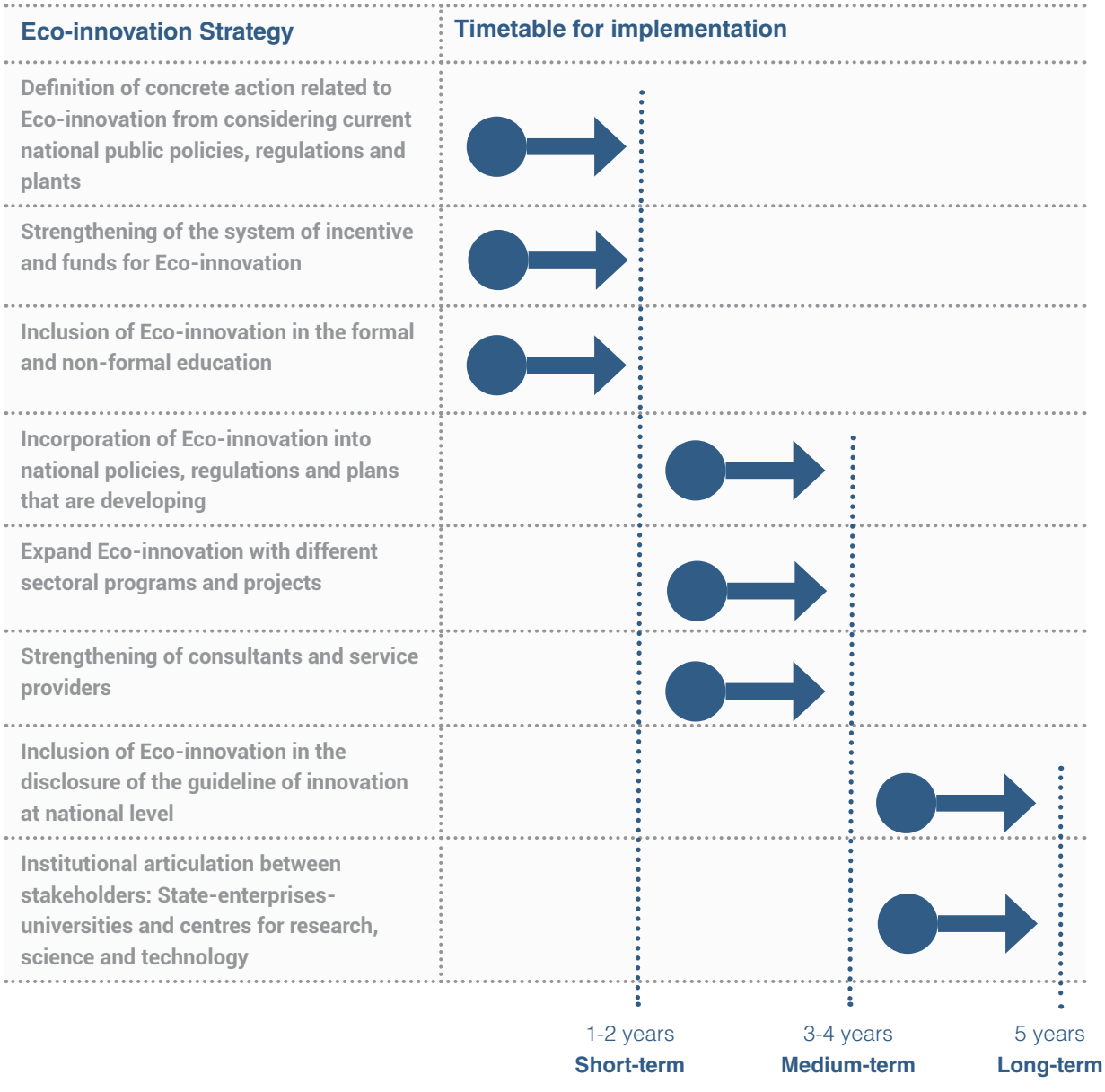
Implementation planning is an integral section of new policy proposals and approvals. Eco-innovation policy design and selection should consider the means of implementation. In the national policy reviews conducted for the REEDTE Project, the development of a roadmap of policy actions provided an implementation roadmap for eco-innovation policies (see the case study of Colombia below). The most common recommendations for implementation were coordination within government and between actors, mobilising skills and services to support eco-innovation, and mobilising resources for eco-innovation.

INSIGHTS FROM **THE REEDTE PROJECT: COLOMBIA**

ROADMAP FOR ACTIONS FOR THE IMPLEMENTATION OF POLICY RECOMMENDATIONS

Following policy review, the Colombian Centre for Cleaner Production proposed eight specific recommendations with a specific roadmap of actions for each, outlining time lines for implementation and the allocation of responsibilities.

Figure 4.8: Colombia roadmap for eco-innovation policy implementation



4.3.1 COORDINATION WITHIN GOVERNMENT AND BETWEEN ACTORS

Effective implementation of policy instruments often requires action from multiple government ministries and agencies. The ministries and agencies will require coordination to ensure that the actions are undertaken in a timely manner or as intended in the policy design. For example, changes to food information and labelling regulations may require actions by the ministries of agriculture, health, commerce and trade. Coordination between government departments is essential for effective implementation of complex policy. The REEDTE Project's review of Peru policy recommended an inter-institutional steering committee (see case study overleaf).

4.3.2 MOBILISING SKILLS AND SERVICES FOR ECO-INNOVATION

The skills and services required to support eco-innovation may need to be mobilised to facilitate the implementation of eco-innovation policies. This could be done, for example, through training on life cycle assessment by external service providers for governments to build a foundation of capabilities and expertise. When recommending the introduction of eco-innovation policies, the skills and resources needed for an effective implementation should be considered. The REEDTE Project's review of Kenya and Colombia recognised skills and services mobilisation as a key implementation task.

INSIGHTS FROM **THE REEDTE PROJECT: PERU**

The policy review for Peru recommended the creation of an inter-institutional steering committee. The committee draws on governments, industry and technical service providers to assist in the implementation of eco-innovation policies and programs.

Framework for strengthening inter-institutional coordination. Committee of Eco-innovation in Peru (CEP)

'In February 2015, as part of the UN Environment Eco-innovation Project the Committee on Eco-innovation Peru (CEP) was established composed of the following institutions: MINAM, PRODUCE, MINCETUR (PromPeru), SNI, INDECOPI, CONCYTEC, SENATI, National Association of Metal Mechanics, UTEC, USIL, PUC and UP. The Committee is chaired by MINAM supported by the Secretariat at GEA / CER Group. Each institution has appointed their representatives who make up the technical working group.

The Committee on Eco-innovation was to provide recommendations and guidance function during the execution of the pilot cases in eco-innovation and to provide input and support for the incorporation of eco-innovation in existing policies and programs. To strengthen its function as the centre for promotion of eco-innovation the following actions are suggested:

- Formalise the establishment of the CEP by legal instruments.
- Promote the active participation of members of the CEP through developing and updating an action plan with timetable and responsibilities.
- Develop a strategy for institutional sustainability beyond the project period.
- Enable its function as observer for eco-innovation knowledge and practices
- Disseminate eco-innovation concepts within each institution constituting CEP and other public fora.
- Undertake awareness raising and capacity development of professional trainers, journalists and establish award programmes.'

4.3.3 MOBILISING RESOURCES FOR ECO-INNOVATION

Policies directed at industry change may need to consider the resources available to support change. An integral assessment of implementation capacity is the funding available for transition and change. Governments may not necessarily fund the change, but may have a role in mobilising resources to where they are needed to implement change in industry. The REEDTE Project's review of Vietnam and Colombia both recommended resource mobilisation as a key implementation action.

4.4 CHECKLIST FOR THE DEVELOPMENT OF POLICIES FOR ECO-INNOVATION

Table 4.6 presents a non-exhaustive practical checklist for designing policies for eco-innovation. It is based on the information from this Chapter and in particular, from Chapter 4.1 and on the categorisation of the instruments presented in Chapter 4.2. The questions below should be considered when developing policy interventions for eco-innovation.

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INSIGHTS FROM **THE REEDTE PROJECT: KENYA AND COLOMBIA**

The KNCPC review of the Kenyan policy context identified shortcomings when it came to the skills and experience required for eco-innovation. The recommendation of that review included supporting intermediate organizations to assist businesses and industries to shift towards eco-innovation.

Strengthening capacity for technological innovation:

'The system in Kenya needs to develop a pool of relevant and adequate skills that must translate into technologically productive competencies within industry. Targets for an education and research system need to be set. These should consider the needs of the industry to ensure effective synergies. However, the Kenyan intermediate organizations have not succeeded in creating an overall system of learning and problem solving. In addition, knowledge brokers especially professional organizations need to develop strong linkages to the business systems in knowledge creation.'

The policy review process in Colombia resulted in a similar conclusion and corresponding recommendation.

Integration of eco-innovation in formal and informal education:

Human resources are the backbone of eco-innovation, thus improving the skills of current practitioners and future innovative capacity is essential to support the sustainable entrepreneurship and become a central model for the private sector. For this reason, eco-innovation must be incorporated in different educational institutions to generate knowledge and eco-innovation capabilities. Given the above, it is proposed to: (I) design curricula containing general ideas of eco-innovation that can be adapted by each education establishment to fit their objectives and go deeper into various aspects, (II) develop training programs for different target groups (enterprises, service providers, schools, universities, civil society), and (III) assess the possibility of creating incubation hubs for eco-innovation projects through universities and colleges.

INSIGHT FROM **THE REEDTE PROJECT: VIETNAM AND COLOMBIA**

Vietnam

The Asian Institute of Technology - VietNam recommended the creation of the eco-innovation fund to support the industry technology and process change. An eco-innovation fund may channel funds from a variety of sources into eco-innovation.

'Eco-innovation fund
Aim is to establish the eco-innovation fund as an integrated fund with existing other support funds (for example the cleaner production fund, science and technology fund, environmental protection fund, SMEs support fund) and mobilise other resources from big companies, donors, and private sectors to contribute to the eco-innovation fund. That could make the support to SMEs more productive and synergised in their innovation.'

Colombia

The National Centre for Cleaner Production and Technologies in Colombia recommended to map funding opportunities targeting green innovation and business practices in SMEs in cooperation with financial institutions that have such schemes and provide training to SMEs for developing bankable projects. In addition, an existing tax incentive offered by COLSCENCES (Administrative Department for Science, Technology and Innovation) should be revised to adjust its provisions and criteria to promote eco-innovation.

Table 4.6: **Checklist for eco-innovation policy development**

Questions to be answered	Answered?
UNDERSTANDING OF STARTING POINT	
✔ Do we know what challenges and opportunities current policies present? ✔ Do we understand the necessary conditions for eco-innovation and current barriers that hamper it? ✔ Do we understand what will or will not work given the political, institutional and cultural context?	
PRACTICE POLICY INTEGRATION	
✔ Are the eco-innovation policies integrated across other policy areas such as SCP, research, science and technology, industry and trade? ✔ Are the selected policy interventions consistent with existing international, regional and national strategies relevant to SCP and eco-innovation? ✔ Is the policy intervention responding to the country's needs and consistent with policy objectives? ✔ Did we consult with ministries from other policy domains relevant to SCP and eco-innovation?	
ADOPT LIFECYCLE THINKING	
✔ Do we consider the issues and impacts from a life cycle perspective? Are we shifting an impact somewhere else: other environmental or social issues, geographical location, sector or stage of a life cycle?	
APPLY VALUE CHAIN APPROACH	
✔ Do we understand what actions lead to unsustainable outcomes and which actors' choices and decision we need to target? Do we understand their interest and reasons?	
BUILD COLLABORATION FOR ECO-INNOVATION	
✔ Did we convene all relevant stakeholders together? ✔ Did we assess which stakeholders to involve and develop a relevant engagement? ✔ Could we do more to encourage collaboration with other key actors, namely in the private sector?	
ADOPT A LONG-TERM VIEW	
✔ Do we think long-term? Do we understand the long-term priorities of the government?	
POLICY MIXES	
✔ Are the selected policy instruments consistent and complementary in their effect?	

CHAPTER **FIVE**

Engagement of **service providers in the policy cycle**

Given their role, expertise and experience, service providers are very well placed to play an important role in the successful development and implementation of policies conducive to eco-innovation.This chapter focuses on the different roles service providers can play during each of the four main stages of the policy cycle, presented in Figure 5.1 below

5.1 DETERMINING THE ROLE IN POLICY CONTEXT

Familiarity with the different policy stages and the activities undertaken during each of these stages will help service providers to identify potential entry points for their contribution. The suggested roles and effectiveness depends on numerous factors, which are outlined below in Table 5.1. The following section describes the potential roles of service providers in greater detail.

Figure 4.9: The four main stages of the policy cycles

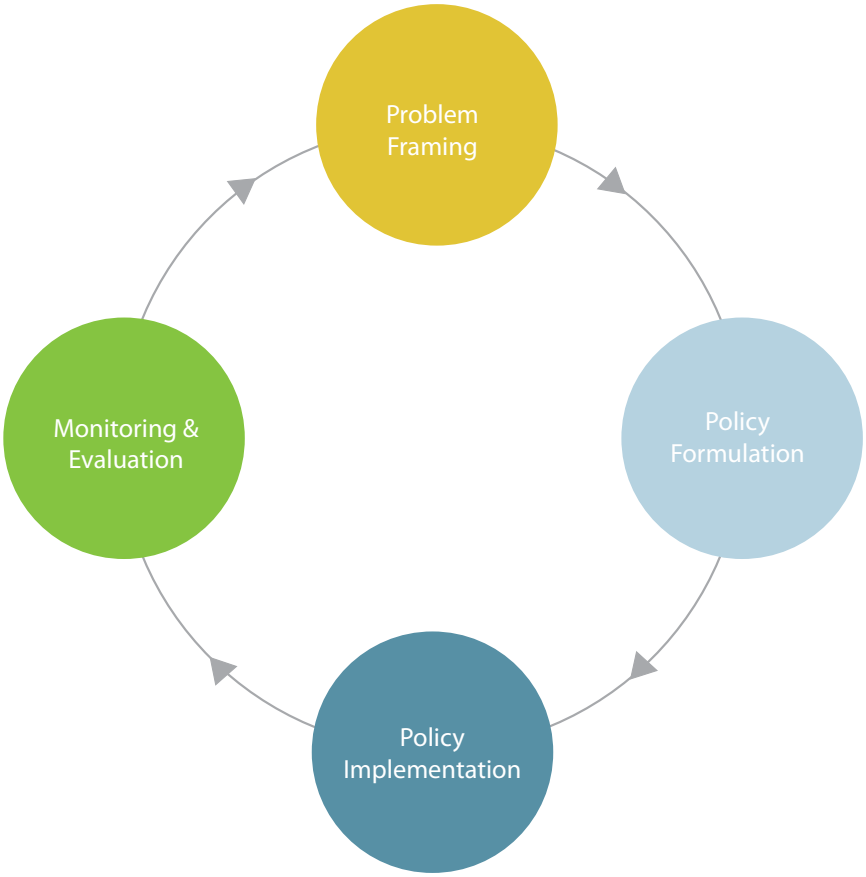

Table 5.1: **Guiding questions to determine a specific role for service providers**

What is your mandate?	The role of service providers depends on their legal status and mandate. For example, the CPL in Chile is part of the Ministry of Economy, Development and Tourism and their position enables them to facilitate the development of VAs between the government and industrial sectors. The CPL is perceived by the industry as trustworthy, allowing them to facilitate this delicate process. Service providers that are not directly linked with the respective government can also function as trusted advisor.
What are the opportunities and entry points for identifying action?	Service providers can undertake policy research or technical assessment of existing national strategies and policies relevant to eco-innovation and their coordination across different policy players. This will help to identify specific challenges, gaps and needs and respond to a specific demand in a policy area.
Do you have a required competence?	Clear assessments of the potential activities and the roles of service providers should be made. Such roles can potentially lead to a conflict of interest. For example, a role in policy formulation and implementation may preclude a role in monitoring and evaluation. Strategic assessments about where in the policy cycle service providers can offer most added value may have to be made.
What is the cost and benefit of your engagement?	Each selected role logically requires specific knowledge, know-how and skills, and (access to) networks to be effective and accepted by the stakeholders. Effective engagement in the policy cycle should not be underestimated. It should be planned properly with regard to internal capacity and capabilities, and the required contacts. If not done properly or performed too hastily, it can even work counter productively.

5.2 ENGAGEMENT OF SERVICE PROVIDERS IN THE POLICY CYCLE

5.2.1 CROSSCUTTING ROLES THROUGHOUT THE POLICY CYCLE

Roles for service providers can be defined at each stage of the policy cycle, and be tailored to the characteristics, requirements and challenges to be addressed at the particular policy stage. However, some roles or 'services' are more generic and crosscutting and can be effectively fulfilled during each phase as outlined in the table below. Other roles may seem focused on one particular stage of the policy cycle but may prove to have a cascading effect on the other stages as the example from South Africa in Box 5.1 shows.

© Centro Nacional de Producción Mas Limpia de Honduras (Honduras National Cleaner Production Center)

Box 5.1: **CSIR supported the revision of the South African National Energy Efficiency Strategy**

The National Energy Efficiency Strategy of South Africa has been in effect since 2005. It aims to improve energy efficiency across the country and in all sectors. Important elements include energy management activities, energy audits, standards, and labelling for energy efficiency, as well as support to R&D activities for the adoption of internationally available technologies for energy efficiency.

Together with the National Department of Trade and Industry the South-African National Cleaner Production Centre (CSIR) played a key role during different stages of the review and revision of this policy:

Problem framing: not only did the CSIR participate in the problem identification, it also facilitated the process by bringing relevant stakeholders together to engage in dialogue.

Policy formulation: the CSIR participated in the process of policy formulation and review, and was asked to be a member of the advisory committee as part of the secretariat.

Policy implementation: the CSIR, as an official partner in the implementation of the programme, carried out the technical audits required during this phase.

The involvement of the service provider (CSIR) across these three stages of the policy cycle opened up opportunities to implement the new policy in industry.

Table 5.2: **Possible roles for service providers throughout the policy cycle**

Facilitate knowledge exchange	Availability of valid information is essential for the formulation of successful policies; service providers can play a continuous role in collecting, validating and/or facilitating an exchange of information. Although lack of information is often cited as a problem, more frequently the issue is how to collect the necessary information, assess its quality and applicability and make it accessible.
Action as link between the public and private sector	SCP and eco-innovation are major crosscutting areas that require active participation between all stakeholders to develop a comprehensive and coherent approach. Evidence shows that the effectiveness of (a mix of) policy instruments is heavily determined by this active multi-stakeholder involvement during all stages of the policy cycle. Well-positioned and trusted service providers can convene and broker in this continuous process given their knowledge of the market and the situation of SMEs, policy area, and understanding of the position of other relevant stakeholders such as universities and technical institutions.
Capacity building and technical assistance	A proper understanding of the issues at stake is key to all policy processes. Besides access to information, ensuring adequate capacity of all stakeholders is one means by which to create a 'level-playing-field'. Service providers can play a role in developing the capacities of all stakeholders. This could vary from general awareness-raising workshops (for an initial understanding of the policy issue) to highly 'technical' trainings (for in-depth analysis of the policy implications and potential solutions for specific sectors) and direct technical assistance to companies, especially SMEs.

Table 5.3: **Further guidance on possible roles through the policy cycle**

Although designed specifically for the Asia-Pacific Region, the SCP Handbook for Policymakers by UN Environment provides a comprehensive introduction to the design of SCP policy.
The SCP toolkit for policymakers in the Mediterranean provides a set of effective tools and instruments, case studies and lessons learned. These can help to build national SCP frameworks and further integrate SCP into national and sectorial policies. The toolkit can be useful for interested stakeholders from around the world.
The United Nations Poverty and Environment Initiative (UNPEI) has developed a database with knowledge resources related to environmental mainstreaming, providing guidance in relation to all stages of the mainstreaming process.

5.2.2 PROBLEM FRAMING: DEFINING THE POLICY PROBLEM

This stage involves the gathering of information and discussions between the policy community and the public on issues related to SCP and eco-innovation. The purpose is to agree on the nature of the problem. This stage is crucial as successful problem framing establishes a firm and solid basis for the policy under development. Raising awareness on issues requiring policy interventions also falls under this stage. Service providers can provide a valuable contribution by facilitating the process but also by strengthening the knowledge base.

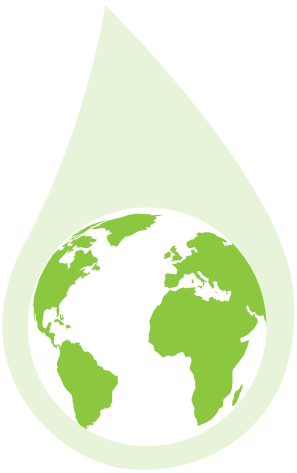

Table 5.4: **Possible roles for service providers during the problem framing stage**

Awareness raising	Limited understanding of the problem at hand will affect the quality of discussions and potential design of solutions. Service providers can contribute to making a clear policy case for eco-innovation by (co)hosting of national, thematic and/or sector roundtables and by preparing and publishing short and concise outreach material and white papers.
Evidence-based communication and story-telling	Potential solutions can be highlighted through, for example, study tours, the provision of case studies from industry, best practices and direct factory visits, allowing policymakers to grasp the links between theory and practice. Through study tours, policymakers can experience various aspects of eco-innovation and can apply this knowledge in future decision-making. This also opens space for dialogue and enhances cooperation and communication, allowing for networking and relationship building.
Good practices	Service providers can help governments to identify and collect international as well as national examples of good practice in terms of (combinations of) policy instruments that could also work in the context of the country. Such good practice examples could help establish necessary benchmarks and targets during the policy formulation process.

TIPS AND REFERENCES FOR SERVICE PROVIDERS

Table 5.5: **Tips and references for service providers in the problem defining stage**

National plans and strategies	Poverty reduction strategy papers, national environmental action plans, national development plans, national sustainable development strategies, millennium development goals implementation plans.
Sector plans and strategies	Policies on waste, water, health, energy, trade and industry, government procurement, transport, education, private sector development, research and development, innovation, minerals, agriculture, chemicals
Budget processes	National budget allocation process or review, sector budgets, subnational budgets
Issue-based strategies	Climate change, biodiversity, cleaner production, industrial development, mineral resource development
Subnational level plans and processes	Local integrated development plans, municipal or subnational budgets, subnational economic development initiatives

FURTHER GUIDANCE

Mapping existing plans, policies, processes or strategies is an important element of a baseline assessment. These could include:

Table 5.6: **Further guidance on problem defining stage**

Awareness raising	✔ The ABC of SCP prepared by UN Environment can help to explain the concepts of SCP to stakeholders that may not yet be very familiar with the concept[49]. ✔ Chapter 2 of this guideline contains relevant information about policies and impactful case studies for SPC and eco-innovation.
Good practices	✔ A wide range of SCP projects examples from Asia can be accessed through the SWITCH-Asia website (www.SWITCH-Asia.eu). ✔ Publications of international organizations such as OECD, UN Regional Economic Commissions, or the World Bank can provide a wealth of influential information on the policies and case studies relevant for eco-innovation. ✔ EU studies and peer reviewed policy case studies are also useful sources of impactful experiences with SCP and eco-innovation. Global Outlook on SCP Policies: Taking Action Together by UN Environment is a comprehensive overview of SCP policies and practices around the world with a number of high impact case studies.[50]
'One stop shop' for SCP	✔ SCP clearinghouse is an online platform that supports the implementation of 10 Year Framework of Programmes (10YFP) on SCP.[51]

49/ UN Environment (2012) The ABC of SCP, online at https://sustainabledevelopment.un.org

50/ UN Environment (2012) Global Outlook on Sustainable Consumption and Production Policies: Taking Action Together, online at http://www.unep.org

51/ The SCP Clearinghouse can be found online at http://www.scpclearinghouse.org

5.2.3 POLICY FORMULATION: IDENTIFYING THE SOLUTIONS

During this phase of the policy cycle, guiding policy principles are identified, a policy position is developed, and policy goals are defined. This potentially results in a (strategic) policy roadmap. New policies are developed and existing ones amended. The roles service providers can play during this stage fall in two main categories, (1) providing accurate and relevant information; and (2) bringing different stakeholders together.

© European Commission

Table 5.7: Further guidance on problem defining stage

Inventory/baseline assessment	An inventory or baseline assessment of the policy context, the policy setting and the supporting conditions required for eco-innovation need to be conducted. The policy context includes threats and opportunities in the market, the problems and needs of the involved stakeholders and their mutual perceived sphere of influence, while the policy setting describes the existing framework, the linkages between different policies, the enabling infrastructure for implementation, and the budgetary conditions among other things. As a 'neutral' actor and with the ability to illustrate potential impact, service providers could conduct the analysis for such the baseline.
Stakeholder mapping and engagement	As part of the baseline assessment or as a separate exercise, stakeholder mapping can be conducted. This can determine who the key stakeholders are, what their interests and requirements are, and any perceived attitudes and/or risks they may have. It can also advise on the best way to engage them during and after the process. This will help to understand potential areas of conflict and leverage points for a building consensual and collaborative framework for policymaking in advance.
Prioritisation of areas of intervention	Following the baseline assessment, service providers can help to prioritise the sectors that need to be addressed in the policy formulation stage of the cycle. By gathering stakeholders and undertaking exercises such as a prioritisation matrix, this will help to limit the areas of interventions for the policy and to make it more focused.
Alignment between policy domains and agencies	Discussions often take place along sectoral lines (environment, industry, economic and financial planning), with limited alignment between policy domains and agencies. Given the role and knowledge of service providers on different aspects of SCP, eco-innovation, and SMEs, they have the potential and an intrinsic capacity to bridge gaps between different government agencies and related stakeholders.
Develop roadmaps	A roadmap should link short-term actions to medium and long-term targets. Working in concert with other strategies, a SCP roadmap for eco-innovation will help to institutionalise sustainability elements and processes for negotiation and consensus building on priority issues.
Comparative analysis/ benchmarking	To develop a policy package that best addresses the policy issue, it is necessary to know which options are most beneficial. This requires a comparative analysis which takes into consideration lessons learned from similar situations elsewhere. In various countries, service providers can be seen playing an active role in this respect.
Illustrating potential impact	The characteristics and impacts of eco-innovation often remain obscure to both policymakers and businesses. A quantitative prediction of the potential outcomes of eco-innovation can help policymakers create linkages between trends, drivers and barriers, on the one hand, and solutions on the other hand. It would also demonstrate opportunities in eco-innovation among consumers, industry, policymakers and other stakeholders.
Convener between Ministries	Multi-stakeholder dialogues are important when dealing with complex issues, especially in policymaking. This includes the involvement of different government ministries and levels in the policy formulation process. Service providers have the potential and the 'intrinsic' mandate to bridge gaps between different government agencies, improving relations, forming networks, building alliances and inducing coordination mechanisms.
Manage a transparent and participatory process	To accept a particular policy measure/mix and avoid non-compliance, stakeholders need to trust the process in which the policy package was developed, and be convinced of its benefits. Service providers can serve as trust manager, repairing any communication breakdowns that may occur. The emphasis is on process management and on the application of a cooperative and participatory approach. It is important that all parties see the service provider as trusted broker.
Draft and review policy text	The specific technical knowledge of service providers, combined with the fact that they often have a close relationship with the government (sometimes they may be sitting within a ministry), provides them with the opportunity to contribute to the text of a new policy. This could be by drafting (elements of) the new policy, reviewing the draft policy text and coordinating public consultation around the draft policy.

Box 5.2: **CNP + LH in Honduras supports the formulation of national cleaner production policy**[52]

In 2006, the National Cleaner Production Centre of Honduras (CNP+LH) began supporting the development and adoption of a national policy on Cleaner Production (CP). The process started by engaging key national authorities, such as the Secretary of Natural Resources and Environment (SERNA), the Secretary of Industry and Commerce (SIC), and the Honduran Council of Private Enterprise (COHEP).

Once the right stakeholders were engaged and the processes defined, the CNP+LH elaborated a draft policy, adapted from the Central American Commission on Environment and Development's CP regional policy (2005) and the environmental policy of Honduras (2005) – especially its fifth principle which promoted CP. The CNP+LH also created a CP Committee with representatives from SERNA, SIC and COHEP, under the coordination of CNP+LH.

Subsequently a participatory process of policy design began. With the support of the CP Committee and the facilitation of CNP+LH, several consultation workshops were conducted to adapt the draft to the needs of the country. Open workshops where also conducted with representatives of relevant sectors, academia, government, businesses and NGOs. The process took up to two years, after which it was possible to define an official draft of the CP policy for Honduras.

After the approval of the initial draft, the highest authorities from SERNA, SIC and COHEP signed the letter of acceptance of the CP policy, with the president of Honduras approving the CP policy through an executive decree in March 2009. Developing the CP policy through a participatory process allowed it to be appropriated and embraced by different stakeholders in the country, and also contributed to raise awareness for other sustainable consumption and production issues in Honduras in subsequent years.

52/ Interview with the representative of the CNP+LH of Honduras

TIPS AND REFERENCES FOR SERVICE PROVIDERS

A SWOT-analysis can be useful when undertaking a comparative analysis of different policy options. It is a structured planning method that helps to identify:

Strengths: characteristics of a policy giving it advantage over others;

Weaknesses: characteristics that place the policy at a disadvantage relative to others;

Opportunities: elements that the policy could exploit to its advantage; and

Threats: elements in the environment that could cause trouble for the policy.

Honduras Yojoa Trading Company, participant at the CNP+LH program for a cleaner production © 3BLMedia

Box 5.3: **Egypt NCPC supporting policy formulation**[53]

The city of Cairo was selected to pilot the development of a SCP city programme within the framework of the region of Africa's 10YFP. As the focal point and committee member for SCP - the Egyptian National Cleaner Production Centre (ENCPC) was requested by the Ministry of State for Environmental Affairs (EEA) to lead the process for the Cairo Governorate. The ENCPC sits within the Ministry of Industry, Trade and SMEs, and being the SCP focal point enables its greater visibility among other relevant ministries.

Consultations with stakeholders during the policy formulation stage resulted in the selection of four thematic target areas: solid waste management, industrial development, urban development (with a focus on slum areas), and transportation and its emissions. The ENCPC steered the process and was requested to provide specific technical support to industry when the government implemented the programme with the identified pilot projects.

To raise awareness for the programme, the ENCPC involved the Governor (the ultimate decision maker) from the beginning of the process. The Governor then had a working group assigned to follow and participate in workshops with stakeholders. Working down from the sectorial through to the regional and then city level, allowed improved communication with and between policymakers and stakeholders to initiate evidence-based communication through the ranks to the ultimate decision makers.

This example highlights the opportunities and intervention points available for intermediaries to play an active role. It also highlights the importance of convening all stakeholders to develop an effective and actionable policy programme for implementation. In addition, specific lessons learned by ENCPC from this experience include: the unbiased role of the intermediary in the process, the importance of targeting the needs of beneficiaries of the process, and creating a sense of their ownership, as well as the need for a specific catalyst to trigger the action. In this case, it was the African Regional Action Plan on SCP for Cairo City.

53/ Interview with the representative of the Egyptian National Cleaner Production Centre and UNEP,(2012), Global Outlook on SCP Policies: Taking Action Together. UNEP

FURTHER GUIDANCE

Table 5.8: **Further guidance on policy formulation**

Baseline assessment	✔ The guidance on undertaking a baseline assessment (legal review and market readiness analysis) provided in the Sustainable Public Procurement Implementation Guidelines of UN Environment can be adjusted to be used in the context of eco-innovation. ✔ Innovation indicators used by statistics agencies at both national and international level can provide a useful reference for status assessment and for the identification of gaps and barriers. ✔ Useful guidelines also exist for the analysis of the innovation system itself. These include the manual Technological Innovation System Analysis, prepared for analysts, and the Organization for Economic Cooperation and Development's (OECD)short method on regional innovation assessment and a new approach for analysing national innovation systems in developing and emerging economies.
Stakeholder mapping and engagement strategy	✔ Project Stakeholder Analysis by the Imperial College London is the popular framework among development and government agencies for conducting stakeholder mapping based on influence and interest grids.

5.2.4 POLICY IMPLEMENTATION: EXECUTING AND FINANCING

Policy implementation is the practical stage of the policy cycle when resources are allocated, communication and enforcement activities are undertaken and monitoring mechanisms are being established. Implementation requires informing affected parties, building capacity to ensure compliance, and establishing enabling programmes and infrastructure. The possible roles of service providers in this stage range from capacity building to involvement in eco-innovation (funding) schemes and from awareness raising to bridging the gap between R&D and the application of research results in the market.

Table 5.9: **Possible roles for service providers in the implementation stage**

Prepare Action / Implementation Plan	The development of an action or implementation plan includes establishing enabling structures and institutions, defining their roles and interactions, as well as preparing a coherent schedule for implementation. Providing support to the development and (co) monitoring of such a plan would be a fitting role for a service provider, which also requires bringing together different ministries.
Awareness Raising	Lack of communication leads to sub-optimal implementation of new policies as well as a lack of compliance. Service providers are well positioned to communicate directly with stakeholders and government. Service providers can support communication and outreach strategies of government.
Capacity Building	Service providers can train/assist governmental institutes involved in the implementation and guide companies, and more specifically SMEs, on how to comply with the (new) policies.
Maintain the support system	The availability and accessibility of concise information is important for proper implementation of SCP policy. This is even more critical for eco-innovation which relies on a supporting system that enables interaction, productive links and multidisciplinary collaboration. Service providers can play a key role as information hubs for industry. They can offer information on how to comply with policy requirements, foster interactive learning and connect with respective research communities.
Support pilot initiatives	Service providers can become involved in implementation through launching innovative pilot initiatives that serve as examples of compliance to other SMEs. They could also develop concepts for innovative/innovation public-private partnership projects.
Facilitating access to finance	Service providers can become involved in implementation through launching innovative pilot initiatives that serve as examples of compliance to other SMEs. They could also develop concepts for innovative/innovation public-private partnership projects.
Bridge the gap between R&D and application	Well-positioned service providers can bridge the gap by translating R&D policies to industry, facilitating the inter-firm transfer of knowledge and technologies, and fostering productive linkages between scientific institutions and industries for mutual benefit.

Box 5.4: **Implementing sustainable public procurement policy in Colombia**[54]

The Colombian National Cleaner Production and Environmental Technologies Centre (CNPMLTA) has been actively working since 2008 with government entities to implement Sustainable Public Procurement (SPP) in the country, providing services not only in technical areas but also in the policy formulation domain.

CNPMLTA was a member of the Steering Committee that conducted a legal study to determine the possibility of implementing SPP in Colombia and prepared a review and analysis of the Colombian public procurement framework in order to identify possible constraints and opportunities for the implementation of SPP. The CNPMLTA supported the development of technical sheets on sustainability criteria for the purchase of goods and services, training of public entities nationwide, the assessment of public entities on how to implement real SPP cases, and established a monitoring methodology for SPP.

Since 2012, CNPMLTA has been signing annual agreements with the Ministry of Environment and Sustainable Development (MADS), producing concrete results in the implementation of SPP for Colombia. In 2013, MADS requested CNPMLTA to undertake a legal review of a parliamentary initiative that 'seeks to promote the purchase of goods and services with environmental criteria, and promote the implementation of environmentally friendly practices within state agencies'. In addition, the task included the preparation of a draft on technical norms to regulate environmental definitions, technical criteria and requirements for any environmental claims made by producers in advertising their goods and services.

54/ Information provided by representative of CNPMLTA and online at: http://www.minambiente.gov.co/contenido/contenido.aspx?catID=348&conID=7469#iv

TIPS AND REFERENCES FOR SERVICE PROVIDERS

An action plan could have the following structure and content:

- ✔ Provision of the context and highlighting priorities
- ✔ Political support and definition of responsibilities
- ✔ Specific activities for service providers
- ✔ Capacity building and communication on eco-innovation
- ✔ Eco-innovation in action: impactful case studies
- ✔ Identifying priority product groups and services for eco-innovation
- ✔ Engaging the private sector
- ✔ Monitoring & evaluation
- ✔ Budget and timeframe

FURTHER GUIDANCE

Table 5.10: **Further guidance on policy implementation**

Prepare Action / Implementation Plan	The UN Environment's Sustainable Public Procurement Implementation Guidelines provides practical information about how to prepare an Action Plan, which can be used to create an Action Plan for eco-innovation.[55]
Awareness Raising	Communicating Sustainability was prepared by UN Environment to show how the power of communication can be harnessed to promote sustainable lifestyles. It can be used to develop and implement public awareness campaigns on issues related to sustainability.

55/ UN Environment (2012) Sustainable Public Procurement Implementation Guidelines, online at http://www.scpclearinghouse.org

5.2.5 MONITORING AND EVALUATION: ENHANCING PERFORMANCE

Continuous monitoring can allow policymakers and businesses to modify aspects of the policy that are not working towards intended objectives. When a policy is implemented, this stage allows the policy process, its implementation and its effectiveness to be examined. The results of the evaluation can feed into the problem framing stage of the new, iterative phase of the policy cycle. As an intermediary between the private sector and government, service providers can play an essential role in policy monitoring and evaluation.

© Switch Asia

Box 5.5: **Indicators for a resource efficient Green Asia[56]**

As part of the policy support component of the SWITCH-Asia programme, UN Environment has developed indicators on resource efficiency and SCP in the Asia region. In addition to the indicator database there are resources to assist policy development for resource efficient and green growth.[57]

Several processes and indicators are used to monitor and evaluate national progress on SCP and green economy measures. This includes national peer reviews, external auditing, and quantitative and qualitative indicators. The processes and indicators were developed through an extensive multi-stakeholder process involving various regional and national partners including NCPCs and other service providers. The workshops and assessments resulted in a shortlisting of 10 to 12 headline indicators for common reporting across Asia and Pacific countries.

56/ Switch Asia Communication Facility website http://www.switch-asia.eu/

57/ UN Environment (2015) Indicators for a Resource Efficient and Green Asia and the Pacific, online http://www.unep.org

Table 5.11: **Possible roles for service providers in the monitoring and evaluation phase**

Develop Indicators	Already a few indicators have been developed and are being used to monitor and evaluate national SCP programmes. Several service providers have knowledge on how to measure and monitor SCP at company level. They can aggregate this information. This knowledge could be valuable when actively participating in the development and testing of indicators when these are not yet in place.
Collect data	Service providers can train (and/or assist) enterprises on how to collect data. They can further assist government agencies involved in national data collection to aggregate and interpret the collected data. The importance of this can hardly be underestimated. Without having access to good and relevant data, indicators have no use. It is therefore important to pay attention to the availability and collection of data while developing the indicator sets.
Policy making	Service providers can play a role in the monitoring of a policy. This is an activity that should already be planned within the policy formulation phase.
Develop reporting guidelines	Service providers are gaining knowledge on how to compile information on SCP at the company level into clear reports. Several reporting systems are already in place, such as the Global Reporting Initiative (GRI) and service providers may support their application to the priorities of the country.
Evaluate existing policies	Monitoring and evaluation should occur before, during and after a policy is implemented. The evaluation can include an analysis of why the intended results were achieved or not, a policy's causal contribution to respective results, the implementation process, the exploration of unintended results, the documentation of lessons learned and recommendations for improvement. The results of this evaluation can feed into the next policy cycle. When service providers are not directly involved in the policy formulation and/or implementation stage, they will be able to play a role in impartially monitoring and evaluation the policy.

TIPS AND REFERENCES FOR SERVICE PROVIDERS

Indicators need to be SMART, that is:

- ✔ Specific – it must be possible to translate the indicator into operational terms and make it visible.
- ✔ Measurable – the indicator must have the capacity to be counted, observed, analysed, tested, or challenged.
- ✔ Attainable – the performance target must accurately specify the amount or level of what is to be measured in order to meet the result/outcome.
- ✔ Relevant – the indicator should be a valid measure of the result/outcome and be linked through research and professional expertise.
- ✔ Time bound - the indicator is attached to a time frame. The indicator should state when it will be measured.

FURTHER GUIDANCE

Table 5.12: **Further guidance on monitoring and evaluation**

Develop Indicators	SCP Indicators for Developing Countries were developed by UN Environment to provide guidance on the development of indicators that measure progress towards more sustainable patterns of consumption and production.
Review of outcome to impacts	The practitioners' handbook 'Review of Outcomes to Impacts' is the evaluation method developed for the Global Environmental Facility and is based on the 'Theory of Change' approach. This is the methodology for an in-depth assessment of how project interventions lead to certain chains of results and contribute to the achievement of high-level impacts, a fundamental and durable change in the condition of people and their environment brought about by policy. Also useful is the Guidance Checklist on Impact Assessment and Appraisal targeting policymakers.
Results based monitoring and evaluation	The OECD portal for Results Measurement and Monitoring provides useful resources for practitioners on result-based monitoring and evaluation of developments in projects and policies.

5.3 SUMMARY

Service providers can play an active and sometimes even pivotal role in the entire policy cycle of policies for SCP and eco-innovation. This chapter explored different strategies service providers can apply to pro-actively engage with the cycle, illustrated by experiences of service providers from around the world. Table 5.13 below summarises the roles

Table 5.13: **Summary of roles for service providers**

POLICY STAGE	CHALLENGES TO BE ADRESSED	CONTRIBUTION	POSSIBLE ROLES
Cross-cutting	Complex and intertwined nature of barriers to eco-innovation, across the policy and across the innovation cycle	Facilitate the policy process and strengthen knowledge base and capacity	✔ Facilitate knowledge exchange ✔ Act as intermediary between the public and private sector ✔ Capacity building
Problem framing	✔ Discussions often along sectoral lines ✔ Limited alignment between policy domains and agencies ✔ Limited understanding of the benefits of eco-innovation ✔ Limited involvement of civil society in the policy discussion ✔ Scientific basis of the issues is limited	Establish firm basis for the policy, both in terms of content and in terms of process.	✔ Undertake an inventory for supporting measures/ existing policies for eco-innovation. ✔ Help prioritisation ✔ Bridge gaps between policy domains and agencies ✔ Raise awareness and communicate ✔ Collect good practices
Policy formulation or development	✔ Lack of incentives for eco-innovation ✔ Different policies may have built-in contradictions ✔ Insufficient linkages with existing policies ✔ Policy objectives sometimes formulated ambiguously ✔ Needs and specific conditions of SMEs not sufficiently considered	Support the formulation of policy instruments by providing accurate and relevant information and bring different stakeholders together.	✔ Develop roadmaps ✔ Comparative analysis ✔ Illustrate potential impact ✔ Act as convener between ministries ✔ Serve as a trust manager ✔ Draft and review policy text
Policy implementation	✔ Limited understanding of the objectives of the policy and the policy instruments ✔ No match between policy instruments, its objectives, and the actual market conditions ✔ Limited capacity and/or capability for implementation ✔ No clear coordination channels ✔ Insufficient policy monitoring mechanisms ✔ Unclear enforcement and compliance mechanisms	Support the execution of agreed policy packages – assisting both the government as well as those impacted by the policy (including SMEs)	✔ Prepare action/ implementation plan ✔ Raise awareness ✔ Undertake capacity building ✔ Serve as information hub ✔ Support pilot initiatives ✔ Involvement in eco-innovation schemes ✔ Bridge the gap between R&D and application
Monitoring & Evaluation	✔ Indicators and targets are often not properly formulated ✔ Relevant data insufficiently collected and aggregated ✔ Limited capacity for monitoring, evaluation and review	Support collection of evidence-based information on the impact of the policy instrument(s)	✔ Develop indicators ✔ Develop reporting guidelines ✔ Collect data ✔ Evaluate existing policies

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Example Terms of Reference: **Policy Review for Eco-innovation**

ANNEX **ONE**

PURPOSE

BACKGROUND

Country assessments are required to inform t the analysis of the policy context for eco-innovation. The national policy context for eco-innovation includes the system of government, the policymaking processes, the policy settings and the institutions responsible for implementation. The Terms of Reference are for a country assessment to inform and develop policy settings to promote eco-innovation.

UN Environment has developed tools to support local capacities and technical assistance:

- ✔ A Business Case for Eco-Innovation clearly demonstrates why eco-innovation makes good business case based on examples of eco-innovative companies from around the world.
- ✔ An Eco-Innovation Manual, which provides a step-by-step guide to support service providers in assisting SMEs to implement eco-innovation.
- ✔ Three sector-specific supplements for agri-food, chemicals, and metals provide technical guidance on how to practically implement the eco-innovation methodology.
- ✔ SCP Policy for Eco-innovation guideline for Resource Efficient and Cleaner Production service providers and policymakers.

OBJECTIVE AND OUTCOMES

The Terms of Reference are for a country assessment to inform and develop policy settings to promote eco-innovation. The objective of this project is to produce a reasoned analysis of the country context, the opportunities for government support of eco-innovation, and the recommendation of next steps for policy action.
The outcomes of this project are to include, but not be limited to, a report on the opportunities for mainstreaming of policies for eco-innovation within the country. The report should evaluate the national context and government readiness for eco-innovation, conduct an inventory of policies which affect eco-innovation, and identify areas of opportunity to improve the policy environment overall and in particular sectors. Further, it should identify ready actions which can be undertaken by the government. A recommended template for report structure is provided in this annexure.

QUALIFICATIONS / SPECIAL SKILLS OR KNOWLEDGE FOR A TECHNICAL EXPERT

An advanced university degree in environmental or industrial economics, environmental policy or another related field with a special focus on developing countries and/or economies in transition.

A minimum of 10 years of professional experience specifically related to the international SCP policy field, the promotion of sustainable business practices in industry, eco-innovation and/or equivalent topics.

Substantive knowledge and experience of sustainable consumption and production policies and tools, including industrial policy that promotes resource efficiency efforts.
Ability to clearly identify and evaluate national and regional policies and communicate the mutual benefits for RECP service providers and public stakeholders in developing and transition economies. Specific knowledge of working with SMEs would be an asset.

EXCELLENT RESEARCH SKILLS

Proven ability to write and present complex policy-related issues for a non-technical audience. Excellent English writing skills are necessary.

DURATION

A policy review may be conducted in as little as one month, however a longer duration of up to six months may be expected where interviews and sectoral analyses are undertaken. A duration of one year or more may be needed where there is government involvement and approval of recommendations for policy action is necessary.

WORK PLAN

A recommended workplan is provided below, however a consultant may propose an alternative workplan that achieves the desired objective.

STAGE	POSSIBLE ACTIVITIES
Eco-innovation in business and what it requires of policy and industry	✔ Desktop study: Initial appraisal of eco-innovation as business strategy, including an assessment of what eco-innovation requires of businesses, industries and governments. ✔ Interviews: initial appraisal from interviews with UN Environment staff, service providers and businesses which have implemented eco-innovation.
Analysis of international and national policies, regulations and institutions	✔ Desktop study: Examine the pertinent international and national policies, regulations and institutions to identify those which create barriers and those which create incentives for eco-innovation. ✔ Interviews: validate desktop study findings through interviews with government officers, services providers and business.
Analysis of sector specific policies, regulations and institutions	✔ Desktop study: Examine specific sectors, such as agriculture and food, to evaluate policies, regulations and institutions that affect the eco-innovation capacity within sectors. ✔ Interviews: validate desktop study findings through interviews with government officers, services providers and business.
Synthesis and develop recommendations	✔ Desktop study: Synthesise the information gathered in stages 1 to 3, evaluate policy context, identify opportunities for government support for eco-innovation and recommend next steps for policy action. ✔ Stakeholder participation: present draft findings to stakeholders and seek feedback on the evaluation, opportunities and recommended next steps.

ANNEX **TWO**

Checklist for eco-innovation policy development

Questions to be answered	Answered?
UNDERSTANDING OF STARTING POINT	
✔ Do we know what challenges and opportunities current policies present? ✔ Do we understand the necessary conditions for eco-innovation and current barriers that hamper it? ✔ Do we understand what will or will not work given the political, institutional and cultural context?	
PRACTICE POLICY INTEGRATION	
✔ Are the eco-innovation policies integrated across other policy areas such as SCP, research, science and technology, industry and trade? ✔ Are the selected policy interventions consistent with existing international, regional and national strategies relevant to SCP and eco-innovation? ✔ Is the policy intervention responding to the country's needs and consistent with policy objectives? ✔ Did we consult with ministries from other policy domains relevant to SCP and eco-innovation?	
ADOPT LIFECYCLE THINKING	
✔ Do we consider the issues and impacts from a life cycle perspective? Are we shifting an impact somewhere else: other environmental or social issues, geographical location, sector or stage of a life cycle?	
APPLY VALUE CHAIN APPROACH	
✔ Do we understand what actions lead to unsustainable outcomes and which actors' choices and decision we need to target? Do we understand their interest and reasons?	
BUILD COLLABORATION FOR ECO-INNOVATION	
✔ Did we convene all relevant stakeholders together? ✔ Did we assess which stakeholders to involve and develop a relevant engagement? ✔ Could we do more to encourage collaboration with other key actors, namely in the private sector?	
ADOPT A LONG-TERM VIEW	
✔ Do we think long-term? Do we understand the long-term priorities of the government?	
POLICY MIXES	
✔ Are the selected policy instruments consistent and complementary in their effect?	

Transitioning to an inclusive green economy based on sustainable consumption and production patterns requires new sustainable business strategies and models and a supporting policy framework. These new business models with sustainability at its core result from the implementation of eco-innovation approaches and are enabled through policy frameworks that bring together multiple relevant areas. Policies relevant to eco-innovation range from sustainable production and consumption, environmental protection, industrial development to science, technology and innovation. The coordination, design and implementation of these policies rest on the following key principles in order to effectively support eco-innovation: life cycle thinking, value chain approach, partner collaboration, policy integration, and adoption of a long-term view. In addition, the policy implementation requires mobilization of skills, services and resources.

The objective of this publication is to provide practical guidance for policymakers and service providers to create a policy context that is conducive to eco-innovation, thus enabling systemic changes in production and consumption patterns. This publication reflects the results of a three-year effort within the context of the Resource Efficiency and Eco-innovation in Developing and Transition Economies project, funded by the European Commission and presents a broad range of examples across industry sectors, environmental aspects and geographical areas.

European Commission

UN environment
United Nations Environment Programme