(Draft)
DISCUSSION PAPER

Eco-Design in Asia: An Overview

Table of Contents

List of Table

List of Figures

Boxes

What is Eco-design? : Definition, key features, and benefits

Rationale and Definition

Human consumption of natural resources has more than tripled over the last 50 years and continues to grow. Past and current patterns of natural resource use are resulting in increasingly negative impacts on the environment and human health prompting the need to advocate for a new production model that makes optimal use of resources and energy (UNEP, 2019). Concurrently, significant efforts have been put in remedial actions of human production such as waste management and pollution control to manage the negative environmental impacts. Though necessary, such actions alone do not have the potential to reduce the environmental impacts to a degree that facilitates a sustainable society (Charter and Tischner, 2001). Studies revealed that interventions at the design stage of products and services have a much higher potential to improve their environmental performance (Brezet and Van Hemel, 1997; Behrisch et al., 2011) in which such interventions are usually termed as "eco-design".

Eco-design (or ecological design) is a proactive approach which directs product or service development towards environmental impact reduction throughout its life cycle, striving for products and services which make the lowest possible environmental impact (European Environment Agency, 2014; Charter, 2019). In practices, the environmental requirements must as well be compatible with other product's criteria such as functionality, performance, aesthetics, quality and cost (Johansson, 2002). As stated by Pigosso et al. (2010) that no environmental improvement will be achieved unless new products are competitive and can fully replace low environmental performance products.

The above description is aligned with the views of eco-design stakeholders in Asia. Through a preliminary survey of the project, the respondents from various countries in the region provided a definition of 'eco-design' as:

> 'a proactive approach in designing products and services that use minimum resources and energy and have minimum negative environmental and social impacts throughout their life cycle while meeting the users' needs of functionality and quality'.

Key Features of Eco-design

Interventions to reduce environmental impacts in products and services require innovation, either incremental or fundamental innovation and could be undertaken in each of the product life cycle: from conception to development, from use to end-of-life. Key features of eco-design in product life cycle or eco-design wheel are as follows (SVID, 2018; Monsjou, 2019; Iberdrola, 2020 and see Fig.1).

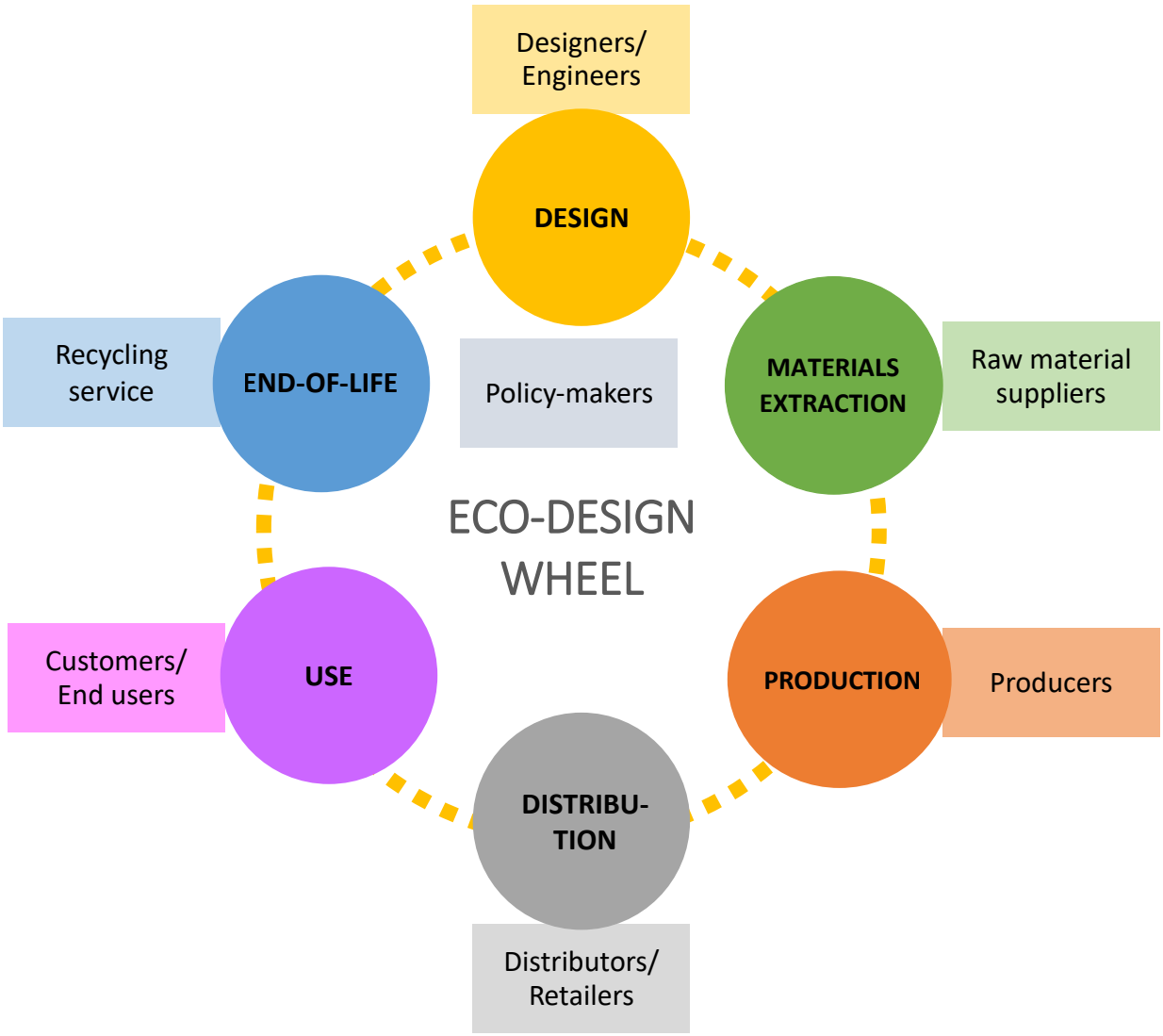

Figure 1. Eco-design wheel and respective actors

Source: Adapted from SVID (2018).

- **Design:** Eco-design approach aims to understand the user's needs and environmental impact of a product or service throughout the whole system or through lifecycle thinking. Considerations include, for example, understand the user's needs and behaviors in using the product and service, design for circular value and supply chains, and intend to add new ways to use and reuse the product through technical and social innovations for loop closing.

- **Materials extraction:** To have low environmental impact of material usage, considerations include, for example: reduce material and energy usage by applying smart production techniques; design for longer-lasting products with less material; use of fewer materials, components and parts through modularization and standardization; and use of clean materials, removal of hazardous substances.
- **Production:** To optimize processes to minimize negative environmental impacts, considerations include, for example: increase energy and resources efficiency in production; using clean/renewable energy; produce less pollution, emission and waste; and apply industrial symbiosis to emulate sustainable cycles in industrial networks.
- **Distribution:** Sustainable distribution aims for the lowest possible impact in an overall supply chains, from storage, order processing, packaging, to delivery to the customers. Considerations include, for example, reduce, minimize and optimize packaging materials; optimize transport infrastructure; and use Internet of Things for tracking distribution.
- **Use:** Eco-design works for efficiency in use and maintainability as well as optimization of initial lifetime. Considerations include, for example, design for longevity, easy maintenance and reparability. Products and services that require fewer resources during operation and cause less waste and pollution when they are used by end customers. Product as a service or service-based business models such as sharing platform, renting, swapping, collaborative consuming, could also be considered.
- **End of life:** The final stage in the eco-design wheel focuses on optimization of end-of-life systems. Considerations include, for example, end-of-life-collection and take-back programs, recovery and recycling, up-cycling and reverse logistics.

Key Benefits of Eco-design

Eco-design is a win-win approach. The concept benefits company that applies the process, the consumer wishes to make responsible choices and society as a whole. Key recognized benefits are as follows.

Economic Benefits

Eco-design is a cost-effective approach that can directly reduce costs for producers and investors though many means. Economic benefits in product manufacturing include lower raw material procurement costs, fewer product losses and lower energy costs, lower transportation and distribution costs, and lower end-of-life management costs. In terms of eco-design in buildings, green building can achieve between 25 and 50 percent in energy savings and the benefits could be gained from both new and green retrofit buildings (Dodge Data & Analytics, 2016).

Competitive and Reputational Benefits

Environmental performance has become an increasingly important component of a company's reputation (Miles and Covin, 2000). A number of cases in various businesses illustrated that green branding has made companies different and provide them a competitive advantage. Eco-design products and services generally meet green consumers' expectations, strengthen the company's competitive position, develop team culture in promoting innovation and improve supplier relationships.

Environmental and Ecological Benefits

Primary environmental benefits of eco-design approach are on reduction of raw materials and resources used, reduction of energy requirements, reduction of impacts on human health as well as reduction of waste quantities sent to landfills. The UK's Waste and Resources Action Programme (WRAP) has provided corporates with eco-design guidance that reported to result in a reduction of 6.6 million tons of greenhouse gases or equal to 2.2 million fewer vehicles on the road for 1 year and consequently avoided production of 12.6 million tons of residual materials (WRAP, 2020).

Eco-design for a Circular Economy in Asia

By 2030, the global middle class is expected to reach 5.3 billion people, in which most of this growth will be in Asia. China and India together will represent 66 percent of the global middle-class population and 59 percent of middle-class consumption. While the expanding middle-class could be a driver for economic development, changes in consumer behavior and consumption patterns are expected to increase demand for food, water and energy by approximately 35, 40 and 50 percent respectively by 2030 (the European Union, 2020).

In the context of climate change impacts, massive resource extraction and global population growth particularly rising middle-class consumption mentioned above, experts agree that our current economic model characterized as linear take-make-dispose systems is no longer sustainable. The consequences are environmental degradation and, in the long term, critical resource scarcity. **A circular economy** is proposed as an alternative economic model that seeks to decouple economic growth from material dependency. The concept is to increase resource use efficiency and reduce environmental impact at all stages of the product (goods and services) life cycle while allowing us to meet our needs within planetary boundaries and developing the well-being of people (Dohmen and Confiado, 2018).

The material loops in the circular economy can be closed in different ways using different concepts and tools. According to the UNEP circularity platform, circularity could be built upon value retention loops in four steps (Fig.2):

- User-to-user processes: shorter loop, where a product or component remains close to its user and function
- User-to-business processes: medium/long loop, where a product or component is upgraded and producers involved again
- Business-to-business processes: Long loop, where a product or component loses its original function

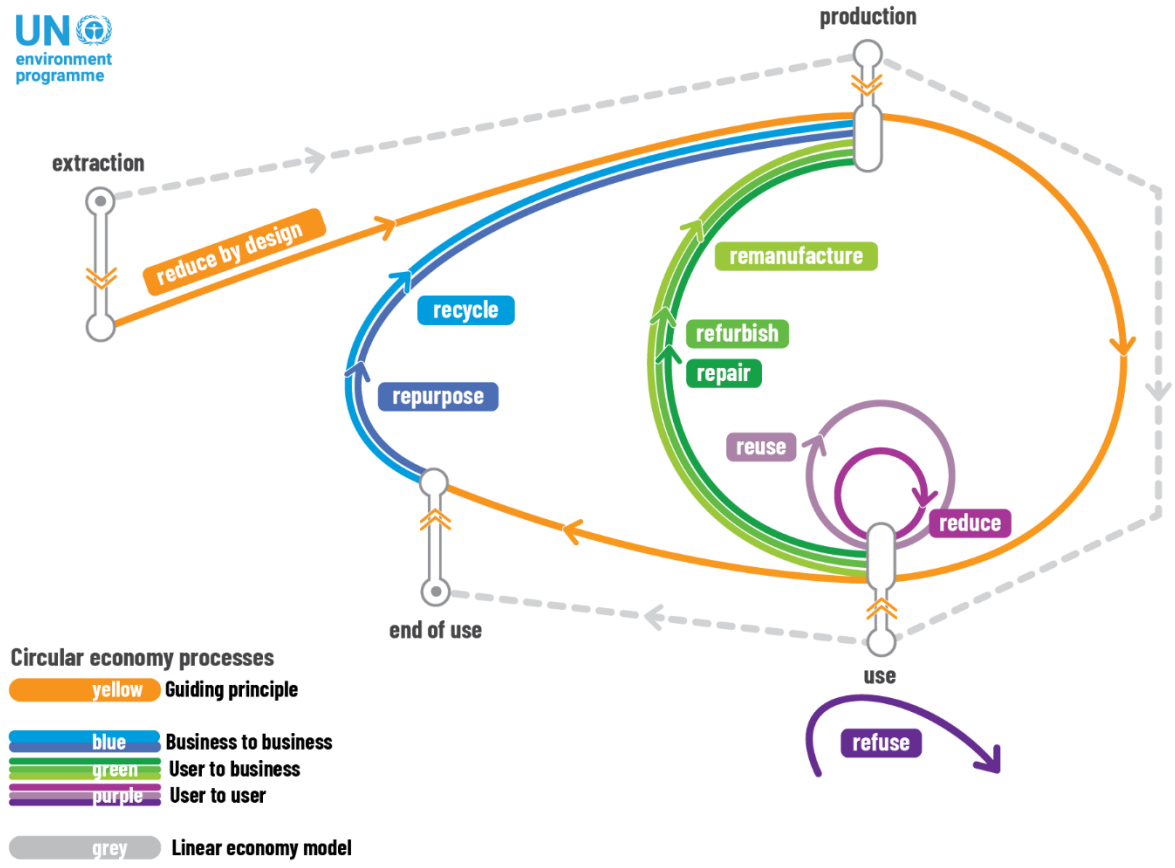

Figure 2. UNEP circularity platform

Source: https://buildingcircularity.org/

Eco-design or **reduce by design**, as an overall principle, applied in the early stage of design and thus leads to the design of products and services that are using less materials per unit of production, and/or during their use. Reduce by design therefore influences all stages of the lifecycle of a product or a service: less raw material is extracted, the production has been designed to be using less materials, consumption patterns and end of life of such products and services are influenced by the design in order to lead to less impact and less waste.

Drivers and Barriers to Eco-design

The benefits of sustainable production affect both industry and society. The United Nations advocates the approach as a means to improve people's quality of life, increase competitiveness, and lower economic, environmental and social costs. Despite the benefits, majority of corporates today have not yet established eco-design practice in their principal product and service development (Paulson and Sundin 2015). Production firms and service providers are generally influenced by internal factors (e.g. resources and capabilities) and external factors (e.g. market and regulations) when taking decisions for eco-innovations.

According to the project's survey[1], eco-design practitioners in Asia ranked the key drivers and barriers to adoption of eco-design approach as shown in Fig. 3 and Fig. 4.

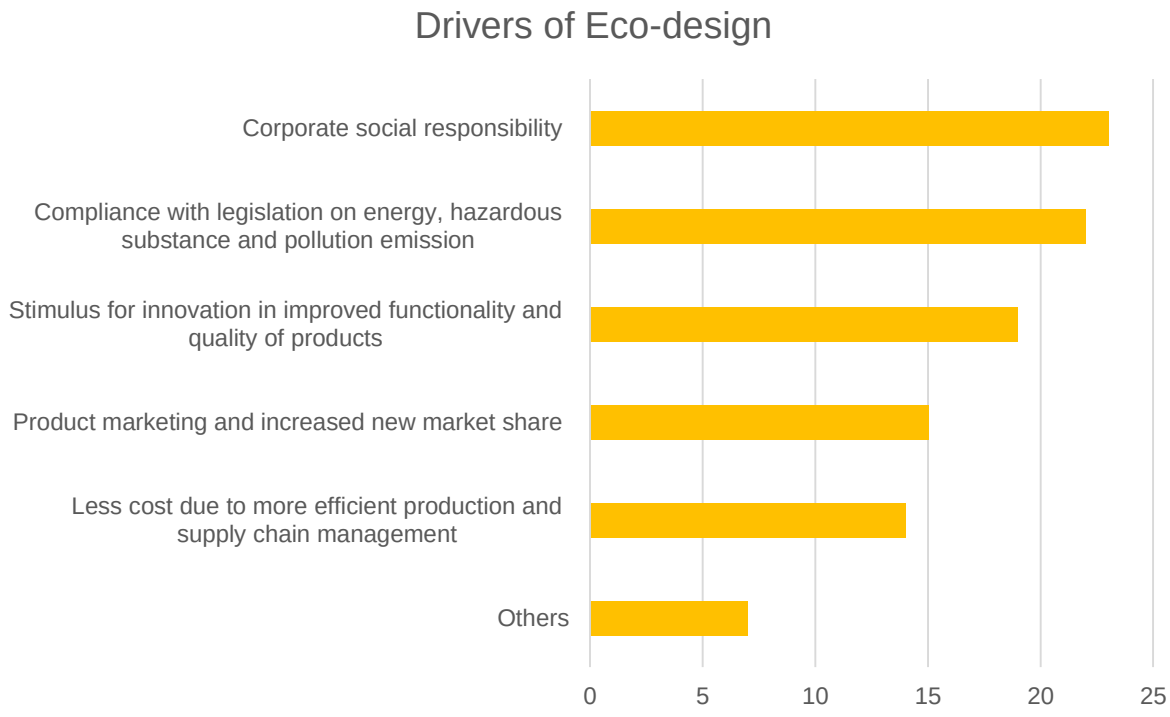

Figure 3. Key drivers of eco-design adoption

[1] The project, under the SWITCH-Asia Regional Policy Advocacy Component, conducted a preliminary survey to contextualize eco-design practices in Asia. Respondents of the survey were individuals, public agencies, private corporates involving in eco-design policy and/or product/ service development in 19 project targeted countries, including Afghanistan/ Bangladesh/ Bhutan/ Cambodia/ China/ India/ Indonesia/ Lao PDR/ Malaysia/ Maldives/ Mongolia/ Myanmar/ Nepal/ North Korea/ Pakistan/ Philippines/ Sri Lanka/ Thailand/ and Vietnam.

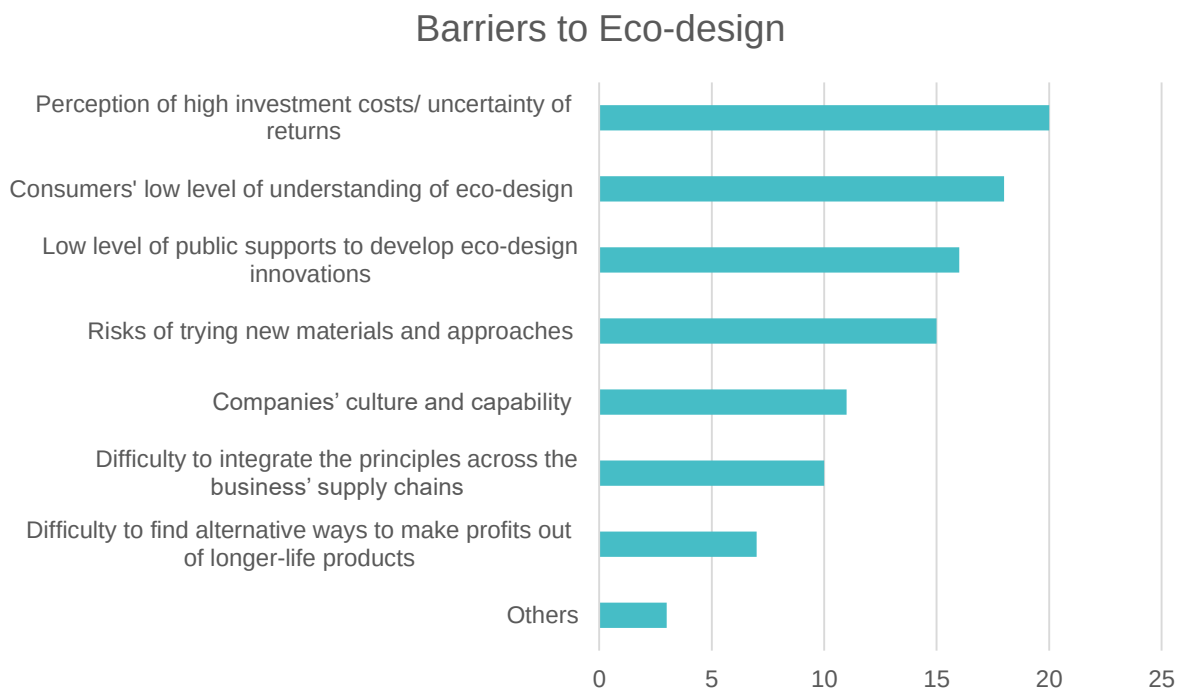

Figure 4. Key barriers to eco-design adoption

Source: Preliminary results of the project's survey (August-October 2020).

The survey results indicated that the first two drivers of eco-design adoption were for corporate social responsibility (23%) and easier and lower cost of compliance with legislation on energy, hazardous substance and pollution emission (22%). These followed by stimulus for innovation in improved functionality and quality of products and improved environmental performance (19%), product marketing and increased new market share (15%) and less cost due to more efficient production and supply chain management (14%). Other drivers identified were contributions to the corporate's image, environmental sustainability and circular economy and the government's eco-labelling program.

Key barriers to eco-design adoption identified were perception of high investment costs and uncertainty of returns (20%) and consumers' low level of understanding of eco-design (18%), following by low level of public supports to develop eco-design innovations (16%), risks of trying new materials and approaches (15%), companies' culture and capability (11%), difficulty to integrate the principles across the business' supply chains (10%) and difficulty to find alternative ways to make profits out of longer-life products (7%). Other barriers identified included lack of skilled human resources, lack of clear enabling legislations and regulations and low level of collaboration among key stakeholders.

Past studies also identified barriers to eco-design particularly in SMEs (see for example, O'Rafferty and O'Connor, 2010; Prendeville et al., 2014). Major barriers were classified according to internal and external factors. Internal factors include 1) SME culture (e.g.

view of sustainability as periphery to core business) and 2) SME capability (e.g. lack of managerial and operation resources, lack of viable technology options). External factors include 3) networks (e.g. lack of external supports to develop eco-design innovations) 4) institutions (e.g. regulators lack resources and expertise to address eco-design issues) and 5) infrastructural barriers (e.g. low levels of investment in eco-design related R&D, no suitable end-of-life infrastructure).

Eco-design Practices in Asia[2]

The continent of Asia covers 29 percent of the Earth's land area and has a population of around 4.5 billion (as of 2015), accounting for about 60 percent of the world population. Asia's rise to global significance is apparent in major macroeconomic indicators including GDP and consumption. In real GDP terms, Asia's share was 34 percent in 2017, and is expected to reach 46 percent by 2040. On consumption, Asia accounted for 23 percent of global consumption in 2000, rising to 28 percent in 2017 and could account for 39 percent in 2040 (United Nations, 2019; Tonby et al., 2019). The rapid growth of emerging economies in Asia has attracted manufacturing facilities of multinational companies as well as improving per capita income and thus purchasing power of people in the region (Pereira et al., 2019). Simultaneously, Asian countries' environmental burdens are high and is by far the largest emitter, accounting for CO_2 emission of 53 percent of the world's total (Ritchie, 2019). Implementing eco-innovation in Asian countries would hence contribute to achieving green growth of the region as well as the global sustainable development.

In recent years, the development of public policies and the efforts of private corporates in Asia's major economies have shown increasing awareness of the interdependence of long-term economic wellbeing and environmental sustainability. The following discussion of eco-design practices in Asia therefore divides into two prongs: "top-down" state induced interventions and "bottom-up" voluntary and market-driven efforts by private businesses in the supply chain.

State induced eco-design interventions

The role of the government is crucial for implementing and diffusing eco-design approach at the national level. Government could develop enabling structures for eco-friendly goods and services; provide policy instruments for eco-innovations such as environmental regulations, financial schemes and R&D programs; and foster eco-design markets. In

[2] The section is based on a review of available literatures and the contribution of eco-design practitioners in selected countries in Asia under the project's activities.

overview, eco-design policy interventions in Asian countries can be divided into three public policy instruments: planning and regulatory, economic, and regional and international cooperation and networking which are described as follows (see Table 2 for compilation of related legislations).

Planning and regulatory instruments:

According to Jang et al. (2015), most countries in Asia established a national sustainable development strategy after the 1992 UNCED and some has initiated national plans for green growth in the 2000s. These plans generally include eco-innovation sectors such as environmental protection, waste management, renewable energy, clean technology and climate change mitigation and adaptation. Environmental protection and conservation laws were established at various pace during 1970s and 2000s, mainly to control environmental pollution.

Along these lines, several countries established policies for **green public procurement** which has been important tool to promote eco-design market at the initial phase. In China, the Government green procurement has been implemented since 2005 in which government agencies are required to preferentially purchase energy-saving labeled products listed by the Ministry of Finance and the National Development and Reform Commission (Geng and Doberstein, 2008). In Thailand, the Cabinet endorsed the National Green Procurement Plan in 2008 while in Malaysia, the Ministry of Finance plays an important role as the largest buyer in green procurement (IGPN, 2010).

Some countries also established legislation on **resources and energy efficiency** as well as specific acts fostering **renewable energy**. The Government of India, through the Ministry of Environment, Forest and Climate Change, promulgated the national resource efficiency policy in 2019 to mainstream resources efficiency across sectors. China, Indonesia, Malaysia, Mongolia, Philippines, Thailand, and Vietnam introduced a feed-in-tariff (FIT) scheme, a price regulation in which the government purchases electricity at a fixed price, and thus help ensuring that a certain share of electricity generation comes from renewable energy sources (Jang et al., 2015). The Ministry of Public Works and Housings of Indonesia issued Ministerial Regulation on Green Building to support efficiency in the use of resources in construction sector and contribute to reduction of greenhouse gas emissions.

Economic instruments:

Many countries in Asia provide financial schemes for promoting green technology and support corporates actively operating in eco-friendly production. According to KPMG (2017), the focused areas of incentives are in **renewable energy**, **eco-innovations**,

material resources, **waste management,** and **pollution control**. Malaysia, for instance, offers an Investment Tax Allowance of 100 percent of capital expenditures incurred for green technology. In India, several campaigns by the government have given an impetus to eco-design startups by providing monetary support to innovators. Indonesia provides an import duty exemption for the purchase of equipment and material used in the prevention of environmental pollution. Similarly, there is a duty exemption clause in the import and export regulation of Maldives for eco-friendly products. On the penalty side, the Ministry of Finance of Vietnam has established an environmental protection tax particularly on nylon bags and an environmental protection fee for wastewater in production process.

Regional and international cooperation and networking:

Several countries in Asia lead and contributed to ecological modernization in the region. Japan started the Top Runner Program in 1998 to improve the energy efficiency of products. Simultaneously, the Republic of Korea implemented the 21st Century Frontier R&D Program to develop technologies such as hydrogen energy and carbon dioxide reduction (OECD, 2008). At the regional level, Japan introduced its experiences on the 3Rs in waste management and made efforts to create a model of sustainable material cycle nation. In 2009, the Regional 3R Forum in Asia was established at Japan's proposal as a platform for broad cooperation on 3Rs promotion in Asia. The Fourth Regional 3R Forum held in Ha Noi in 2013 adopted the Hanoi 3R Declaration, Sustainable Goals for Asia and the Pacific for 2013-2023, which aims to provide a basic framework for the Asia-Pacific countries to develop measures and programs to promote the 3Rs towards transitioning to a resource-efficient and green economy (Ministry of the Environment Government of Japan, 2020).

International and aid agencies have also supported eco-friendly production and consumption of Asian countries through various programs and projects. Recently in July 2020, India and the European Union adopted a joint declaration on moving toward a more circular economic model that provides for reduction in primary resource consumption and enhances the use of secondary raw materials. At the regional level, the European Commission launched the SWITCH-Asia program in 2007 to promote sustainable production and consumption in the region. There are 130 projects funded in 20 Asian countries so far of which 22 new projects are currently active (SWITCH-Asia, 2020). Other related programs were, for instance, the Sustainable Product Innovation Project (SPIN) in Vietnam, Cambodia and Lao PDR supported by the SWITCH-Asia Programme (2010-2014); Clean Production and Energy Efficiency Project in Vietnam implemented by the World Bank through GEF fund (2011-2017), and the Global Clean Tech Program for SMEs in Pakistan, India, Malaysia and Thailand implemented by GEF/UNIDO (2011-2020).

Voluntary and market-driven efforts by the businesses

A key business driver for eco-design is to increase brand value and product marketing. A number of corporates today therefore voluntarily make claims regarding environmental performance of products or service operations that are of concern to their shareholders and customers. A number of **national and international award programs** in the past years such as The Shenzhen Global Design Award[3] by the Shenzhen City of Design Promotion Association and the IAI Design Awards[4] hosted annually by the Asia Pacific Designers Federation has gained increasing interests from designers in the region in which their award criteria include energy efficiency, environmental protection and social responsibility among general design criteria as design concept and creativity, functionality and aesthetic.

To qualify products or services proven to be environmentally preferable, **eco-labelling** has now been a common voluntary method of environmental performance certification in the region. There are a number of well-respected eco-labels in Asian countries to report on the products' environmental performance (such as the Philippines Green Choice, Malaysia SIRIM Eco-Labelling Scheme, Indonesia Ecolabel, China Environmentally Friendly Certification, Thailand Green Label, Kazakhstan Eco-Labelling, and the India Green Pro), as well as eco-labels in the export destination countries (such as the Nordic Swan Ecolabel, Australia Good Environmental Choice, EU Ecolabel, and the North America Green Seal).

Figure 5. Eco-label programs in various countries

Source: Global Ecolabelling Network (GEN) https://globalecolabelling.net/

[3] https://s-d-a.org/

[4] http://en.iai-ap.org/Design-Contests/IAI-Awards/index.asp

Based on the Global Ecolabelling Network (GEN) survey 2019 results, GEN eco-label represents 1,612 valid standards worldwide and around 17,000 companies are participating as licensers. In the market, 84 percent of GEN members are specified by the government environmentally preferable purchasing (EPP) programs. The consumer awareness or confidence survey however indicated a wide range of results from 6-93 percent in which awareness is highest among eco-oriented and health concerns consumers (GEN 2020).

Other standard, such as the Electronic Product Environmental Assessment Tool (EPEAT) for IT equipment assesses various lifecycle environmental aspects of a device have national governments, institutional purchasers and consumers in over 40 countries considered as part of their sustainable procurement decisions (EPEAT, 2020). Likewise, recent ISO standards introduced such as ISO 14006 established the guidelines to incorporate eco-design into an environmental management system. Acquiring these performance standard could therefore enhance the corporates' competitiveness in the growing green market.

Besides voluntarily compliance, **foreign investment flows and international markets** have shown to contribute significantly to diffusion of eco-innovation in Asia. In addition to the introduction of eco-design policy interventions in Asian countries discussed earlier, the environmental legislations required by the end users' countries is probably the most common driver for corporates in the region to initiate eco-design activities. The Integrated Product Policy (IPP) building on environmental life-cycle thinking adopted by EU in 2003, for instance, has affected many types of product sold within the EU and brought need of adaptations to a number of manufacturers in Asia (O'Hare et al., 2015). Table 1 provides examples of regulations affecting eco-design practices in Asia, which are both the national regulations of the Asian countries and the end users' countries in the US and Europe.

Table 1. Examples of regulations affecting eco-design practices in Asia

Eco-design features	Regulations of the Asian countries	Regulations of the end users' countries
Green innovations and clean technology	China Clean Production Promotion Law (2012) Malaysia Green Technology Master Plan 2030 Mongolia Law on Technology Transfers (1998)	

Eco-design features	Regulations of the Asian countries	Regulations of the end users' countries
	Thailand National Science Technology and Innovation Policy 2012-2021 India Science, Technology and Innovation Policy (2013) Philippines Technology Transfer Act (2009)	
Lifecycle resources and energy consumption of the products and buildings	China Energy Saving and New Energy Vehicle Development Plan 2011-2020 India National Resource Efficiency Policy (2019) Green Building Indonesia (Ministry of Public Works and Housings Decree on Green Building)	EU Directive 2009/125/EC establishing a framework for the setting of eco-design requirements for energy-related products (EuP) EU Regulation 2017/1369 setting a framework for energy labelling
Use of hazardous/ restricted substances	China Restriction of the Use of Hazardous Substances in Electrical and Electronic Products (RoHS 2) 2016	EU Registration Evaluation and Authorization of Chemicals (REACH) Directive EU Restriction of Hazardous Substances (RoHS) Directive US Toxic Substances Control Act
Green procurement	Thailand National Green Procurement Plan (2008) Philippines National Action Plan on Sustainable Public Procurement 2010-2012 China Government Procurement Law (2003)	
End of Life strategy for the products	Vietnam Regulation of Management of Hazardous Waste (1999) Mongolia Law on Prohibition and Export of Hazardous Waste (2000) Pakistan Hazardous Substances Rule (2003) India Recycled Plastics Manufacture and Usage Rules (1999)	EU Batteries Directive EU Waste Electrical and Electronic Equipment (WEEE) Directive Japanese Household Appliance Recycling Law EU End of Life Vehicles (ELV) Directive

Source: Adapted from Jang et al. (2015), O'Hare et al. (2015) and KPMG (2017).

Lindahl (2007), through a study of the state of eco-design in Asian electronic companies, found that most interviewees felt the need to comply to product-related environmental requirements from customers, rather than the national legislators. India, for instance, has 70 percent of electronic companies exported to the EU and most respondents perceived that they were affected primarily by the RoHS Directive. Similarly, most of the respondents in Vietnam noted that except for parts and components made for Europe that must meet the EU Directives, the electronic parts made for other Asian countries were dependent more on the prices. Likewise, it was reported that the electronic and the automotive industries were the most active sectors when the eco-design scheme was first introduced to the Thai industry due to the pressure on environmental regulations from Japan and the EU (Mungcharoen et al, 2007).

In the same way of product design, **green building** has life cycle phases from resource extraction to construction, occupancy, demolition and the disposal of the materials. Principal issues on eco-design in construction sector include, among others, environmental friendly construction materials, energy efficiency and water conservation in buildings, and construction waste management. In many Asian countries, green building councils have been established and provide measurable guidelines performance of buildings such as the BERDE Rating System of the Philippines Green Building Council, Indian Green Building Council, Green Building Council Indonesia, and TREES (Thai's Rating of Energy and Environmental Sustainability) developed by the Thai Green Building Institute.

Despite a number of case examples of sustainable construction in the region, the growth of green buildings in Asia found to be slow. According to a report by Research and Markets, while major European cities as Paris and London had percentage of green buildings of 64 and 68 percent respectively, Asian cities seemed still at the beginning stage. Only Singapore has a relatively high penetration (30 percent) of green buildings, following by Beijing (11 percent), Shanghai (15 percent), Tokyo (8 percent) and Hong Kong (4 percent) (Research and Markets, 2016). At the Green Building and Parks World Conference in 2017, delegates debated on the slow transition in Asia and provided several key factors. These included short-term investment focus in real estate markets, together with perception that green buildings are excessively expensive and low awareness of their benefits among developers and owners (Hill, 2017).

Fang Thai provides environment-friendly options of packaging products from rice straw paper. Its paper is 100% biodegradable in 30 days as well as water, oil and grease resistant for more than two hours with a non-chemical coating solution. Fang Thai is also a 2019 SEED Low Carbon Award Winner.

Source: https://www.seed.uno/enterprise-profiles/fang-thai-factory

Box 1. Example of eco-design in Asia:
Fang Thai: rice straw pulp packaging [THAILAND]

Lai Day Refill Station introduces eco-friendly products and solutions to conscious consumers through providing refill stations for household products made by Vietnamese communities and organizes awareness rising activities of sustainable living.

Source: https://www.laidayrefill.com/

Box 2. Example of eco-design in Asia: Lai Day Refill Station [VIETNAM]

Swiggy Launches Recycling Packaging Materials

Bengaluru-based food ordering and delivery platform Swiggy has announced the launch of 'Swiggy Packaging Assist', a new initiative that enables restaurant partners to get access to variety of packaging solutions including eco-friendly options made of paper and glass materials.

Source: https://www.swiggyassist.in/

Zomato: Working to Reduce Food and Fuel Wastage

Zomato has introduced a new feature in their app that enables customers to opt out of cutlery when they order. The company is also working with kitchens to help them adjust serving portions based on the feedback the company receives on its orders to reduce overall food wastage and looking to reduce fuel wastage with support from its restaurant partners and users to 'pool' delivery routes, thereby reducing fuel consumption while keeping delivery times intact.

Source: https://www.zomato.com/blog/environmental-concerns

Box 3. Example of eco-design in Asia
Swiggy and Zomato Food Delivery [INDIA]

ST Diamond Building, Putrajaya, Malaysia. Winner of the ASEAN Energy Award 2012 and the first office building in Malaysia to obtain the platinum rating of Green Building Index.
Source: https://www.thestar.com.my/news/nation/2012/09/16/diamond-building-wins-top-award-for-energy-efficiency

Junction City Yangon, Myanmar. The mixed-use development opened in 2017 acquired the internationally-recognized Green Mark certification from the Building and Construction Authority in Singapore.
Source: https://www.asiapropertyawards.com/en/shwe-taung-group-myanmar-developer-first-green-loan/

Box 4. Example of eco-design in Asia:
Green buildings in Malaysia and Myanmar

Issues for Further Discussions

Selected challenges identified as major thrusts in promoting eco-design and sustainable consumption and production in Asia are as follows.

- **Need of specific and operational-based environmental policies towards sustainable consumption and production.**
  As illustrated in the discussion, the role of the government for spreading eco-design implementation is crucial. Public policies in Asia need to set clear goal towards widespread implementation of cleaner production and sustainable consumption. Concerned policy instruments should then be aligned and coordinated to support eco-innovations. Operational based policies include, for instance, clear and standardized environmental regulations (e.g. emission discharge standards, restricted substances in products), financial supporting schemes and R&D programs for businesses (e.g. technology transfers in green innovations and clean technology); and promoting of eco-design markets (i.e. green procurement).

- **Need of decision-support tools for selecting, ranking, and optimizing the deployment of green technologies at commercially scale and support of appropriate business models for green innovations.**
  While there is a strong presence of external forces as national legislations and customers' requirements which drive corporates to move toward the provision of sustainable goods and services, accessibility of decision support tools is essential to pinpoint how corporates respond to the sustainability call. Empirical study indicated clearly that the perception of high investment costs and uncertainty of returns remained key consideration prospects for corporates skeptical to adopt eco-design. Practical decision-support tools could therefore facilitate deployment of green technologies and hence assure the corporates in taking decisions. Cases of business adopting eco-design should also not only assess the performance on environmental impact reduction, but also provide valuation on how to be profitable implementing the approach.

- **Need to increase demand of green consumers in Asia.**
  Increasing purchasing power of green consumers is a strong driving force that encourages suppliers of goods and services to integrate eco-design approach into their overall corporate strategy. If the rising living standards in the region is in accordance with sustainable consumption patterns, it would significantly increase domestic demand for green products and services. According to Joshi and Rahman (2015), consumer's environmental concern and products functional attributes

were generally identified as the two major determinants of consumer green purchase behavior. Advocacy programs and market transformation mechanisms would therefore be needed to boost green consumerism in Asian countries.

- **Need of eco-design supporting facilities for Asian small and medium sized enterprises (SMEs).**
  As Asia is today a fast-growing base for the manufacture of various kinds of products of the world, there is a clear need to build up infrastructures to support the Asian SMEs to deal with increasingly stringent legal and customers' requirements in the global industry. Based on Thailand's experiences, to cope with the changes, the businesses need, for instance, access to education, trainings and test and assessment facilities, database for green materials, and research cooperation between corporates and academic institutions (Ramankul, 2016).

  In addition, although there has been a large number of eco-design methods developed to support businesses aiming to reduce environmental impacts of their products, most of these methods however were seen to be designed for large companies and in relation to European companies' contexts. There have been difficulties to be applied especially by Asian SMEs and hence there should be eco-design methods and tools developed considering in particular the specific needs due to socio-political and cultural differences for the Asian SMEs. In Lindahl (2007), for instance, small companies in China, India and Thailand stated that the current eco-design software available was too complicated and too expensive to be used by the SMEs. Their preferred tools and methods should be simple that are quick and easy to apply, software-based rather than manuals, and have relatively low expenses for purchasing and education.

- **Need of green supply chain management and efficient monitoring system for supply chain performance.**
  Whether dealing with upstream suppliers or downstream consumers, harmonizing activities to catalyze corporates to design and produce eco-friendly products and services are directly related to the green supply chain management. Although the discussion documented that eco-design and green approaches were in practice in some corporates in Asia, mostly they were separately considered and implemented given the influences by their respective executives, shareholders, and customers. Past studies also indicated that there were different levels of capacities, motivations and efforts in clean production among upstream, middle stream and downstream corporates (Ramankul, 2016). Compliance costs would decrease significantly if the whole supply chain is strengthened and thus is able to

control the overall materials inputs and production process. Having green supply chain management and efficient monitoring system for supply chain performance in Asia would also shift the business approach from passive compliance of the customers' requirements to an active alliance towards a more resource efficient production.

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ECO-DESIGN IN ASIA

Under the SWITCH-Asia Regional Policy Advocacy Component,
implemented by the United Nations Environment Programme

Objective of the Project:
To increase technical knowledge and enhance common understanding of the concept of Eco-design in Asia through the organization of a regional webinar, which is expected to raise awareness of the importance of eco-design in Asia in general and may lead to discussion to prioritize specific sectors at the regional level.

To contextualize Eco-design practices in the region, we would like to seek help from the partners to please provide your inputs to the following questions.

- **In your opinion, what is "eco-design"?**

  ……
  ……
  ……

- **What you think are the major drivers and barriers to eco-design practices in your country? (can choose more than 1 answers)**

  DRIVERS OF ECO-DESIGN
  ( ) Less cost due to more efficient production and supply chain management
  ( ) Product marketing and increased new market share
  ( ) Compliance with legislation on energy, hazardous substance and pollution emission
  ( ) Corporate social responsibility
  ( ) Stimulus for innovation in improved functionality and quality of products
  ( ) Others, please specify ……

  BARRIERS TO ECO-DESIGN
  ( ) Consumers' low level of understanding of eco-design
  ( ) Risks of trying new materials and approaches
  ( ) Perception of high investment costs/ uncertainty of returns
  ( ) Companies' culture and capability
  ( ) Difficulty to find alternative ways to make profits out of longer-life products
  ( ) Difficulty to integrate the principles across the business' supply chains
  ( ) Low level of public supports to develop eco-design innovations.
  ( ) Others, please specify ……

  Are there current legislations/ regulations/ policies enabling eco-design in your country (similar to, for instance, EU's Eco-design Directive, Japan's Top Runner Approach or Singapore's Minimum Performance Standards or similar approach such as eco-label and green public procurement policy)?
  ( ) Yes. ( ) No.

  if yes, please specify and kindly provide sources for further information
  ……
  ……..

- **Please provide examples/ case studies of eco-design products in your country** (either designed and manufactured by large companies/ SMEs/ or startups in any sectors e.g. construction, electronics, furniture, textile, etc.) (if possible, please provide sources for further information).

  ……
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  ……
  ……

- **Please provide 3-5 names (and contacts, if available) of potential eco-design network members in your country** (i.e. individuals, public agencies, private corporates involving in eco-design policy and/or product development)

  1) ……

  2) ……

  3) ……

  4) ……

  5) ……

For filling in the survey online, please scan QR code.

ENG

Thank you very much for your kind support of valuable information.