

switchasia MAG

Advancing the circular economy in Asia

- + Case-studies of circular economy application in Asian developing countries
- + European Commission, DG Environment: “Moving towards a circular economy”
- + UNEP: “Circular economy is happening in Asia”



Photo: Reducing Plastic Bag Waste project



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The overall objective of the SWITCH-Asia Programme is to promote sustainable growth, to contribute to the economic prosperity and poverty reduction in Asia and to mitigate climate change. For more information, see: www.switch-asia.eu

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Waste management: A pathway to circular economy

By Dr. Uwe Weber

The term circular economy was first coined in the post-1992 debates that discussed international development grand schemes. This discussion included Cleaner Production and Sustainable Consumption and Production (SCP), leading to today's concept of **Inclusive Green Economy**. The formulation and elaboration of these concepts is closely linked to the promotion of the former Millennium Development Goals (MDGs), superseded by the current guidance provided by the **Sustainable Development Goals (SDGs)**.

It is surely important and instrumental to discuss and agree on such grand schemes as guardrails for a country or region's development pathway. However, discussed at an abstract level, such grand schemes risk becoming or remaining buzzwords, disconnected from the daily needs and aspirations of rural and lower middle class populations and the daily life reality of Asian developing counties.

At national levels, SCP blueprints and circular economy roadmaps have been successfully deliberated and formulated. However, it appears that during the formulation of national plans it is often overlooked that **all development actions intended to improve livelihoods need to happen and produce results locally**, involving the local target groups and stakeholders. Local stakeholders, including local administrations, businesses and industry, as well as local populations, must be involved and tasked with putting action plans into practice.

Although local development objectives and targets need to be coordinated and require a conceptual framework, such local actions will not succeed if sufficient pre-conditions for effective policy implementation are not put in place. For example, all local actors already struggle to make financial, human resource and technological ends meet.

This guiding of local development actions by national plan guardrails requires more than consultative involvement of local actors. For such policies to be effective, they must follow established rules of quality management by clearly defining:

- who shall act
- where and
- what shall be done
- when actions shall take place and
- how activities shall be pursued.

Further, apart from this basic organisational analysis and definition of responsibilities, authority and actions with this simple 4W/ 1H matrix, not only are adequate resources, i.e. financial, human and technology, needed to start these actions but they also need to be continuously provided to successfully maintain the started activities. In particular, with regard to waste management this is a challenging task, as **Asian communities spend already up to half of their limited local budgets on the provision of waste management services**. Consequently, looking at the current waste management practices in developing Asia, one has to acknowledge that this is out of sync with daily practice and experience at the street, company or household level. The amount of waste generated by developing Asian countries will easily rise by 60% during the forthcoming decade. Already today in low-income Asian countries significantly less than 70% of waste is collected. In turn, 70% of it is being dumped without treatment into the environment.

From the above not too encouraging snapshot of today's waste management situation in Asia, it becomes immediately evident that the improvement of these current insufficient waste management practices and provisions constitute the 'acid test' for any substantial progress towards a circular economy. While a suitably designed, implemented and maintained circular economy will reduce the need for waste management to a minimum (because this will be replaced by resource management), **it remains nevertheless imperative that comprehensive waste management be set up as a precondition to advancing towards a circular and inclusive green economy.**

Realising that public funds are insufficient to expand waste management in coverage and quality to the level required to move forward to a circular economy, national and local governments in Asia

Recognising and providing adequate resources for the scaling up of these approaches in the context of national circular economy roadmaps remains a sine qua non for any national planning document to succeed.

consider the privatisation of waste collection, management and disposal services. Any such intended privatisation will only deliver the desired results if a clear and reliable policy framework is defined, implemented and maintained, providing the private sector with a long-term reliable framework before substantial investment.

The SWITCH-Asia projects featured in this Magazine and the SWITCH-Asia Briefing on Waste Management in Asia not only provide successful local examples of successful ways towards a circular economy. They illustrate that **recognising and providing adequate resources for the scaling up of these approaches in the context of national circular economy roadmaps remains a sine qua non for any national planning document to succeed.**

ABOUT

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Moving towards a circular economy

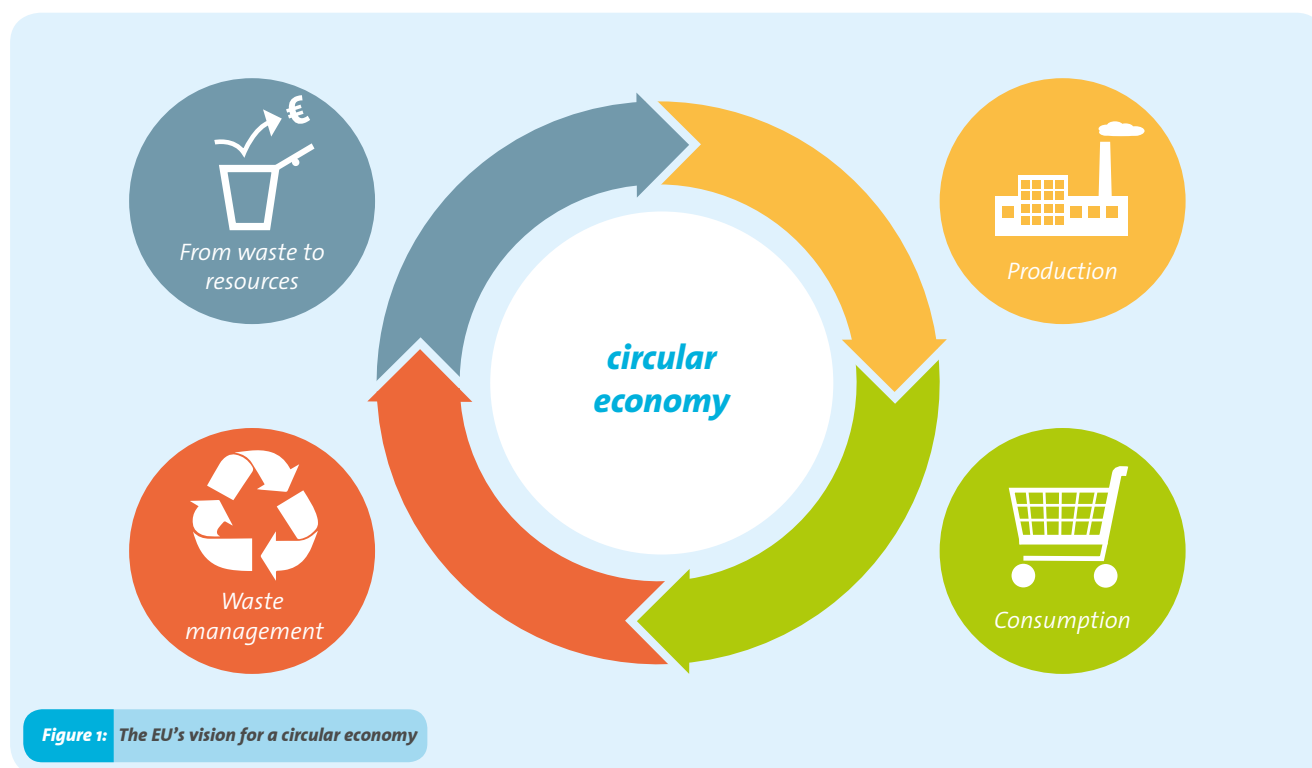
From a linear to a circular model of growth

By Lana Žutelija

The current linear economy leads to the waste of precious resources and overproduction of waste, and does not account for negative externalities exerted upon the environment. Hence, it has become clear that our current linear economic model of 'take-make-dispose' cannot be sustained. We have no choice but to move towards a more circular economic model, under which the value of products and materials is maintained in the economy for as long as possible and waste production

is minimised. The EU has a particular interest in minimising resource use as it is heavily dependent on imported raw materials. In recognition of the need for action, the European Commission adopted a new and ambitious Circular Economy Package¹ in December 2015 after wide public stakeholder consultation and intense cross-sectoral team work steered by First Vice-President Timmermans, Vice-President Katainen, Commissioner Vella and Commissioner Bienkowska. The Circular Economy Pack-

age consists of an EU Action Plan for the Circular Economy² that establishes a concrete and ambitious programme of action, with measures covering the whole cycle: from production and consumption to waste management and the market for secondary raw materials. The annex to the action plan sets out the timeline when the actions will be completed. The Package also includes revised legislative proposals on waste to stimulate Europe's transition towards a circular economy, which will



boost global competitiveness, foster sustainable economic growth and generate new jobs.

For the EU, the circular economy is much more than just sustainable waste management. It is an approach that considers the entire life cycle of a product, closing material loops at each stage of its life. By-products during manufacturing, re-usable products, and materials at the product's end-of-life are no longer considered as waste but as a valuable resource. Resources are kept within the economy as secondary raw materials, to be used again and again to create further value. As such, sustainable consumption and production is essential to achieving the circular economy.

By 'closing the loop' on the former linear model, the EU is also contributing to meeting the ambitious objectives of international agreements. The policies not only directly address Goal 12 of the Sustainable Development Goals of ensuring sustainable consumption and production patterns, but also other goals, such as sustainable economic growth, sustainable water manage-

ment, sustainable industrialisation and innovation, sustainable cities and fighting against climate change. Furthermore, these measures will also contribute to the objectives of the Paris Agreement on Climate Change. In fact, it has been estimated that around 500 billion tonnes of CO₂e could be avoided between now and 2035 by meeting the proposed recycling and landfill targets. The Package is also very much in line with the objectives of the G7 Alliance for Resource Efficiency. Within the European Union, the Circular Economy Package is a key contribution to the Juncker Commission's ten priorities and to the broader agenda on jobs and growth, Europe 2020.

The EU's action plan for a circular economy³ not only brings environmental benefits, but encompasses the other pillars of sustainability: economic and social gains. For the producer, there are direct financial gains from greater resource efficiency and business-driven innovation. The European Commission's study on "The opportunities to business of improving resource efficiency"⁴ indi-

cates that waste prevention, eco-design and re-use could bring net savings of EUR 600 billion for EU businesses, which could then be passed on to consumers thus improving competitiveness. The customer in turn is able to purchase more durable products that provide both monetary savings and increased quality of life. Moreover, this model can also boost secure employment in the waste management sector, particularly in recycling, repair and re-purposing, with an estimated 170 000 additional jobs by 2035.

Ambitious plans and concrete results

The Circular Economy Package establishes a long-term approach to promote waste prevention, increase recycling and reuse, and reduce landfill and incineration. It also sets out measures⁵ to help businesses, citizens and public authorities benefit from this transition. Even though the Package is less than a year old, of the 54 initiatives, one third are already being implemented.

3) COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Closing the loop - An EU action plan for the Circular Economy (COM(2015) 614 final) http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_1&format=PDF

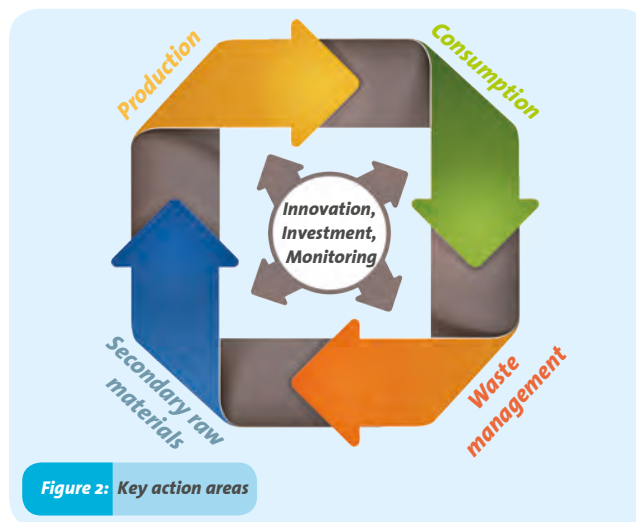
4) The opportunities to business of improving resource efficiency (2013), AMES at al. http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/report_opportunities.pdf

5) ANNEX to the COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Closing the loop - An EU action plan for the Circular Economy http://eur-lex.europa.eu/resource.html?uri=cellar:8a8ef5e8-99a0-11e5-b3b7-01aa75ed71a1.0012.02/DOC_2&format=PDF

Key action areas

1. Production Every year, many valuable materials are lost at the end of a product's life because the product's design makes it difficult or impossible to recover them. Designing products for a circular economy will be supported under the Eco-design Work Programme. As a first step, the European Commission will propose rules for easier and safer dismantling, reusing and recycling of electronic displays. Direct economic incentives will also be introduced for producers to create products that are easily recyclable or reusable through extended producer responsibility schemes. An improved production process, which minimises production waste and over-intensive resource use will be encouraged through Best available techniques Reference documents (BREF) for various industrial sectors. Finally, innovative industrial processes, such as industrial symbiosis (when one industry's waste is another industry's resource) or remanufacturing are already being and will continue to be supported through the Horizon 2020 Programme and Cohesion Policy Funds.

2. Consumption Consumers are also very influential actors for a circular economy transition. The European Commission aims to increase sustainable consumer choices through clearer and more transparent information on the environmental impact of products, such as the enhanced EU Ecolabel scheme and revised guidance on unfair commercial practices so as to tackle false green claims. Enforcement of existing rules on guarantees will also be improved and a recent European Commission's proposal reinforces them for the online sales of goods. Lastly, public bodies, as a significant consumer in Europe, will be encouraged to take up green public procurement practices.



3. Waste management As part of the Package, four revised legislative proposals on waste were put forward that raise the bar for recycling practices and restrict landfill. The set targets are a 65% recycling rate for municipal waste and 75% recycling rate for packaging waste, along with a binding target of only 10% of total municipal waste going to landfill, all by 2030. These proposals are currently being debated in the European Parliament. Moreover, the EU is stepping up enforcement of the revised Waste Shipment Regulation to make sure that illegal shipments causing valuable raw material leakage out of the EU are addressed more effectively. Cooperation with Member States will also be improved to combat the illicit shipment of end-of-life vehicles. Finally, an initiative on waste-to-energy in the framework of the Energy Union will be launched in early 2017.

4. Market for secondary raw materials To bolster the market for secondary raw materials, the European Commission will encourage the development of quality standards for secondary raw materials, in particular for plastics, to ensure they offer comparable and stable quality as their virgin counterparts. A series of actions will also encourage the

reuse of treated waste water, including legislation on minimum requirements for water reuse, with a collection of best practice already available on improving water reuse in water management. Measures will also be implemented to simplify waste shipments across

the EU, which would facilitate trade in secondary raw materials.

Priority sectors

The following priority sectors for the circular economy were identified based on stakeholder input received through the Public Consultation on the Circular Economy⁶: plastics, food waste, critical raw materials, construction and demolition materials, and biomass and bio-based products. They are addressed via dedicated actions under the Circular Economy Package. Importantly, given the immense negative impact of plastic waste on our environment, especially the marine environment, a separate plastics strategy will be adopted in 2017 as part of the Package.

Innovation and investments

The transition to a circular economy is supported via dedicated calls on the „Industry 2020 in the Circular Economy“ within the Horizon 2020 research and innovation programme. Over EUR 650 million is being invested, between 2016 and 2017, in research and innovation projects demonstrating the economic and environmental feasibility of the circular economy approach.

Other financing opportunities will be available through the European

Structural and Investment Funds, the European Union's main investment policy tool providing support to job creation, business competitiveness, economic growth, sustainable development, and improving citizens' quality of life. The LIFE programme, the EU's financial instrument supporting environmental, nature conservation and climate action projects, will also provide funding opportunities for circular economy related projects. In addition to EU public funding, private financing will play a crucial role. The European Commission is assessing the possibility of launching a platform together with the European Investment Bank and national banks to support the financing of the circular economy.

The role of SMEs in a circular economy

Small and medium enterprises form the backbone of the European economy. As such, they also provide great potential for transformative changes towards green growth. A circular economy creates opportunities for new business models, for example in relation to the sharing economy and in the development of new repair and reuse services. Resource efficiency is a source of reduction in production costs and is also a buffer against increasing risk from volatile resource prices and diminishing security of resource supplies. Yet still, many SMEs lack an understanding of the need for and benefits of such a change.

To this end, the European Commission is actively promoting resource efficiency, circular economy, eco-innovation and participation in green markets among SMEs with targeted communications, support and funding. The aim is to make SMEs better-placed to engage in and benefit from the transition.

The flagship initiative for this is the EU's Green Action Plan for SMEs⁷ (GAP) that has been implemented since 2014. It includes 34 actions at the European level on capacity building, promotion

and financing that focus on resource efficiency and relate to the circular economy. For example, a Resource Efficiency Excellence Centre for SMEs will be set up in early 2017 to provide training, capacity building and information materials for SMEs and national support organisations. A web-based European resource efficiency self-assessment tool for SMEs is currently being tested during a pilot phase, and will become operational in early 2017.

International outreach

The Circular Economy Package contributes significantly to the 2030 Agenda for Sustainable Development. It directly addresses a number of Sustainable Development Goals and in particular the goals on sustainable consumption and production, sustainable economic growth, innovation, sustainable and resilient cities and climate action. With the Circular Economy Package, the EU aims to address economic and environmental concerns by maximising efficiency in the use of resources, covering the whole value chain, and, through innovation, enabling the development of new markets and business models. As such, it contributes to sustainable economic growth. The full implementation of the Package will direct resources and efforts in the direction of technologies and business models that will be more resource and energy efficient thus providing an important contribution to the mitigation of GHG emissions. It will also make a contribution to the development of cities in the direction given under this goal.

The European Commission values its international partners and strives towards mutual encouragement of ambitious actions in sustainability. As part of its circular economy activities, the European Commission is increasing cooperation between the EU and international partner countries in the field of environmental policy. Such initiatives include, for example, the „Circular

Economy Missions“⁸, which engage the private sector through business partnerships facilitated by matchmaking events in third countries between European and local entrepreneurs or exchanging views with target audiences.

The SWITCH-Asia partner countries are important actors in the transition towards a circular economy and crucial partners of the European Union. The expertise of SWITCH-Asia and the work on sustainable consumption and production and the green economy represent an important source of knowledge, experience and existing networks and can contribute significantly to the EU's work on the circular economy, through the exchange of best practice, networking and dissemination activities, and joint projects.

The European Commission alone cannot ensure the transition to a circular economy – this needs effort from everyone, and businesses in the first place. Therefore, cooperation with all the relevant stakeholders, including international partners, through existing networks and platforms or through new ones to be defined if needed, is essential. The Circular Economy Package aims to initiate the transition towards a more circular economy and to turn it into a win-win-win situation for all: for the economy, for the environment and for individuals. This is an important step towards the modernisation and sustainability of our global economy.

ABOUT

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⁷ http://ec.europa.eu/growth/smes/business-friendly-environment/green-action-plan/index_en.htm
⁸ http://ec.europa.eu/environment/international_issues/missions_en.htm

Business model innovation as an enabler for a circular economy

By Francesca Grossi and Mariana Nicolau



Business model innovation respecting environmental boundaries through the increased share of renewable or recyclable resources, while reducing consumption of raw materials and energy, represents one of the most powerful enablers of a circular economy (CE). Traditional business models, relying on large quantities of cheap and easily accessible materials and energy, are reaching their physical limits (EPRS, 2016). Innovative approaches, based on

eco-design, repairing, refurbishing, and recycling, coupled with the spreading of a lifestyle culture based on sharing, renting, lending and service-based models have been emerging in several sectors, e.g. mobility, textiles, electric and electronic equipment. Well-known examples are, for instance, the American company Xerox, producer of copying machines that in 2010 ventured into the managed service sector by enabling its customers to lease printing and

copying machines, paying per print or copy made, inclusive of maintenance costs. GoMore and SideCar offer 'apps' that match drivers with free spaces and people in need of a ride. The Swedish company, Filippa K, collects its used own brand clothing from customers – in return for a rebate coupon for future purchases – and then resells them in specialised shops.

CE business model categories

All of these innovative business models require substantial and/or incremental changes throughout the value chain. These can range from product design and technology, extending product lifetimes, turning waste into a resource, to the promotion of new modes of consumer behaviour (EEA, 2016). Thus, on the basis of their functional focus, it is possible to categorise them into different models.

The so-called **service- and function-based business models** promote the usage of the functions of a product instead of its physical ownership. As in the case of Xerox, consumers are incentivised to retain the functions of a product, through leasing and renting rather than by purchasing it. Various types of service- and function-based

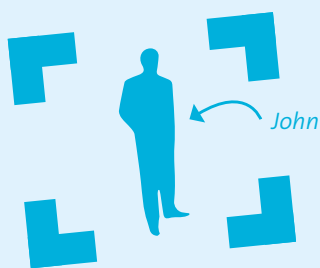
business models can be distinguished: *product-oriented services*, still centred on product sales, but including additional services such as maintenance and take-back agreements; *user-oriented services*, which are based on product leases, rentals, sharing and pooling; and more *result-oriented services* providing specific outcomes, such as the creation of a pleasant climate in offices (Tukker and Tischner, 2006).

Collaborative consumption business models are centred on the concept of revolutionising consumers' purchasing habits through sharing, swapping, bartering, trading or leasing products and/or other assets (e.g. land or time) (Botsman and Rogers, 2010). While such peer-to-peer interactions have long been practiced on a local scale – among neighbours, e.g. by sharing food or garden equipment – more recently,

they have developed into a different dimension through the increased use of online consumer-to-consumer (C2C) marketplaces (EEA, 2016). Examples are the online platform Peerby that matches people in temporary need of a specific object with those who have the object and are willing to lend it, free of fees; Shareyourmeal, a website enabling the sharing of cooking in the neighbourhood, reducing food waste and fostering personal interaction.

Focusing more on recyclable resources and reduction of raw material usage, the **waste-as-a-resource business models** promote cross-sector and cross-cycle links creating markets for secondary raw materials, with the aim to reduce the use of energy and materials, and also to facilitate locally-clustered activities to prevent by-products from becoming waste, e.g. industrial symbi-

Turning lifestyles circular – Integrating the lifestyle perspective into the circular economy



John uses an integrated urban mobility app that allows him to check and choose the most sustainable and convenient options to move around, including public transport and neighborhood e-bike and e-car sharing schemes. He works in a co-working space whose equipment and infrastructure are leased and regularly upgraded according to the best available technology. He is also about to move into a 4-generation house, which has its own food garden.

Future vision or reality?

Current views on a more circular economy are mainly focused on business-to-business interactions. Consumers are only marginally considered, usually as key actors for take-back schemes or for waste stream separation. But actually to close the loop and to move away from the non-linear use of resources and energy, consumers need to be actively engaged to make innovative business models successful in the long-term.

The CSCP has been working on closing the consumer gap in the circular economy, by bringing the lifestyle perspective into the circular economy realm of new business models, policy solutions and social engagement, posing the question 'how can lifestyles become more circular?'. In this context, the CSCP looks into trends and consumer patterns, and engages companies, NGOs, public organisations and civil society to better understand and tackle the implications of circular economy connected to sustainable lifestyles through projects, such as "The Sharing Economy is Scaling Up"; "3GF: Partnership on Innovations and New Business Models for Sustainable Lifestyles"; "Business Innovation for Sustainable Scale-up" (BISS); and "SMART Start-up".

For further information about the CSCP and its work, please visit:

<http://www.scp-centre.org>

<http://www.scp-centre.org/library/publications>

osis (EEA, 2016). A practical example is the National Industrial Symbiosis Programme (NISP) in the United Kingdom. It consists of a network of more than 15 000 industrial companies that identify mutually-profitable transactions to optimise the use of underused or undervalued resources, including energy, water, waste and logistics. So far, NISP has enabled its members to divert 47 million tonnes of industrial waste from landfill, generated GBP 1 billion in new sales and created and safeguarded more than 10 000 jobs in the country (International Synergies, 2015)¹.

Filling knowledge gaps

Notwithstanding these successful examples, the transition to a circular economy will be evolutionary. Innovation and change bring benefits, but also create challenges, such as transition costs (i.e. R&D and asset investments, subsidy payments to promote new business models (EPRS, 2016)); reluctance to systemic consumption shifts due to both implications for everyday lifestyles (e.g. in terms of waste sorting and food waste, purchasing of fast fashion in clothes and electronic devices) and still too little knowledge about the potential benefits of changing towards more circularity. Therefore, in parallel with the need to increase understanding of the circular economy, it has also become important to chart progress and identify where more work is needed to achieve change (EEA, 2016). Although initial analyses and advancements have been made, science, businesses and government are only now beginning to cooperate and to understand circular economy challenges and opportunity areas. It is still difficult to quantify precisely the socio-economic and environmental benefits within a circular economy, together with potential negative effects and trade-offs. The Collaborating Centre on Sustainable

Consumption and Production (CSCP) contributes to filling existing knowledge gaps through different activities ranging from action-driven research, to capacity building to stakeholders' dialogue. An example is the recently-started Horizon2020 project **"Industry 2020 in the Circular Economy"** (R2PI), led by the CSCP, that examines the shift from the broad concept of a CE to one of circular business models, by looking into stimuli beyond environmental goals and analysing the role of policy innovation. Along the same line, is the work conducted by the CSCP within the European Topic Centre on Waste and Materials in a Green Economy (ETC/WMGE)², within which the Centre is a partner. The ETC/WMGE is supporting the European Environment Agency (EEA) to develop a series of circular economy reports targeting not only policy makers, but also businesses and civil society, aiming to contribute to advancing the understanding of the circular economy concept and its implementation. The first report of this series, published on 18 January 2016³, drew attention to the concept of CE and its general benefits, as well as the main enabling factors and transition challenges, metrics for measuring progress and contextual issues that would require attention from research or policy. It highlights how the current knowledge base appears to be rather fragmented, requiring more robust data on new business trends and sustainable consumption patterns together with better indicators (i.e. de-

scriptive social indicators, waste prevention indicators and industrial symbiosis indicators) (EEA, 2016).

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1) The mentioned examples are not intended as the most representative of CE business models, but rather as well-known case studies commonly used in literature to exemplify CE principles.

2) For more information about the ETC/WMGE, please visit <http://www.eionet.europa.eu/etc-wmge>

3) For further information about the EEA first CE report, please visit <http://www.eea.europa.eu/publications/circular-economy-in-europe>

The circular economy and developing countries: A virtuous circle?

An interview with authors R. Gower and Dr. P. Schröder

By Silvia Sartori

In August 2016, Tearfund and the Institute of Development Studies published the report “Virtuous circle: how the circular economy can create jobs and save lives in low and middle-income countries”. In this interview, Network Facility’s Silvia Sartori discusses with authors Richard Gower and Patrick Schröder, the distinct implementation patterns and opportunities associated with expanding circular economy approaches beyond developed countries.

Much literature is available about the concept and application of the circular economy (CE) in developed countries. Your recent study instead looks at the case of developing nations: which are the essential elements of the CE that could be implemented in a phased manner by developing countries, and which of them shall be prioritised? How would you recommend least developed and more advanced developing countries to start the CE?

If we talk about essential elements of the circular economy in developing countries, it makes sense to differentiate between organic or biological resources and manufactured or technological resources. For many developing countries, especially low-income countries where agriculture or forestry constitute a large share of the economy, closing the loop of biological resources is probably the first step. This can be done on a very local scale in many different ways, for example, one of Tearfund’s partners in Brazil helps farmers to use anaerobic digestion to convert animal waste into cooking gas and fertiliser. Middle-income countries can seek to

build on their existing repair and reuse industries (of which Ghana’s Suame cluster is a good example), ensuring that these grow rather than decline as the country develops. At the same time, circular economy practices are crucial to reducing unnecessary and harmful leakage of industrial pollutants into the environment as industrialisation progresses. Technology sharing and capacity-building projects can have a significant impact in this area.

Finally, in both contexts there is a pressing need to engage with the waste management sector, to prevent the waste mountains that typically grow as a country develops, with serious adverse social and environmental consequences.



A biogas digester in Brazil

How can poorer and developing countries benefit from the circular economy? Can the CE contribute to poverty alleviation?

The poor are disproportionately affected by pollution. Almost nine million people in developing countries die of diseases linked to mismanagement of waste and pollutants each year: six times as many as die from AIDS-related illnesses, and 20 times more than die from malaria.¹ Scaling-up of circular economy practices would reduce hazardous waste and pollution that causes these adverse health impacts. The CE is therefore as much about human health as it is about environmental protection, resource efficiency, innovation and jobs.

Circular economy practices can also aid in finding sustainable solutions to the lack of sanitation in fast-growing cities, for example, by placing low-cost composting toilets in areas that have no access to sanitation. An example is Sanergy, which uses an integrated sanitation value chain model. High-quality, low-cost toilets have been set up in the slums of Nairobi, Kenya, contributing to cleaner, safer urban environment

¹ http://www.gahp.net/new/wp-content/uploads/2015/03/UNEP_SDG_FactSheet_March13_2015.pdf

and the waste is used to produce high value agricultural inputs and renewable energy. Sanergy also produces animal feedstock from human waste, using the protein-rich larvae of the black soldier fly. To date, over 700 toilets serve more than 30 000 users each day, and Sanergy has created more than 800 jobs in the communities where they work. This example is a self-sustaining business model and illustrates that the circular economy holds out the promise of new and better jobs. A quarter of those in extreme poverty are either unemployed or in low-quality, dangerous employment, and finding a decent job is a key route out of poverty. A recent meta-analysis of 65 papers on the circular economy concluded that it would create more employment and help fill this jobs gap.

Businesses that apply circular economy principles are among the most competitive in the economy, such as Philips and H&M, according to recent research from McKinsey². Seizing the circular economy opportunity could actually allow developing countries to grow more quickly. After all, most waste represents inefficiency, and eliminating inefficiency is often the key to enhancing competitiveness.

What are the most distinct opportunities, as well as challenges, of trying to integrate the circular economy in a low and middle-income country, compared to the case of the developed world?

Developing nations already exhibit many circular practices and often have a culture of reuse and repair. They can build on these circular foundations as

Brazil (cited in our report) suggests that capacity at the municipality level can prevent good legislation on waste management from being implemented effectively, for example. Unfortunately, the circular economy is only just emerging as a concept in development circles, and there is a pressing need for the major development banks, multilateral agencies and bilateral donors to incorporate expertise on the circular economy into the support they provide to developing countries. Donors and development agencies involved in infrastructure projects, business development programmes and technical capacity building can include circular economy practices and principles into their existing portfolios.

On which local resources, experiences and traditions can developing countries build upon, in order to realise the CE?

In many developing country economies, long-established circular economy practices are still prevalent, such as repair, localised value chains and use of renewable materials. These practices often get lost when countries begin to industrialise and modernise, especially when companies become integrated into global supply chains, which are currently still linear. Furthermore, when people adopt consumerist lifestyles, they adopt 'throw-away' patterns and abandon the principles of reuse. The opportunity for developing countries lies in preserving existing circular economy models and concepts, and in combining these with new technologies, especially ICT solutions.

Are there specific CE approaches that would be particularly fitting to developing countries?

Tackling urban waste issues in cities of developing countries is a priority sector, and circular economy practices that actively involve the informal sector in a participatory manner provide the best solutions to deal with these problems.



So far, the circular economy is almost entirely absent from development cooperation, the SWITCH-Asia Programme being a noteworthy exception.

With the world's current growth pattern and increasing population, is the CE a 'luxury' or a 'must' for developing countries?

It is a must for both industrialised and developing countries. The 'luxury' we cannot afford any longer is to keep running a linear system that is based on high input of non-renewable resources and large outputs of waste that cannot be absorbed by the environment without creating ecological collapse. Circular economy practices, in many cases, do not require expensive technology or high upfront investment. But they do require innovative thinking and thorough planning based on life-cycle approaches by policymakers, businesses and community leaders alike.

Furthermore, the introduction of circular economy practices in industrial sectors enables cost savings, and hence can represent a business case.

they develop. We have already mentioned the potential for supporting informal waste pickers to be formalised and integrated into formal waste management systems, and also the value of supporting existing reuse and repair hubs like the Suame cluster in Ghana. If developing countries take this route, then they can unlock an entirely new sector of the economy that has been ignored in high-income countries until relatively recently.

This is made easier by the fact that low and middle income countries do not yet possess the infrastructure locking them into a linear economic system. This applies throughout the economy: in their supply chains, waste management, water treatment facilities, the built environment, and so on. However, institutional capacity can be a real challenge when it comes to seizing these opportunities. Recent research from

In other areas, from our experience, we can say that bottom-up solutions developed locally are in many cases the most successful. Policy must support these solutions via setting the right framework conditions, for example through appropriate resource pricing systems and household and in particular industrial waste disposal fees, since free resources or low prices for resources lead to overextraction and damage to ecosystems.

Based on your review, can you single out and describe any noteworthy experience with a CE in a developing country?

There are many noteworthy examples. One is the Suame/Kumasi industrial cluster in Ghana, a major automotive re-manufacturing and repair cluster in West Africa. It is a prominent example of the scale and economic benefits of circular business models in developing countries. The extent of activity surpasses anything found in Europe: 200 000 workers are employed – up from 40 000 in the early 1980s – in more than 12 000 small and medium sized businesses and workshops where all types of automotive equipment are repaired and remanufactured. Over 70 percent of Ghana's GDP comes from small, often informal businesses like the ones operating in the Suame cluster, which not only provide for the domestic market in Ghana, but for the whole western African region. The role of formal and informal associations has been important for the development of the cluster, as are national institutes providing basic skills training for technicians and mechanics. This cluster also shows how SCP policies are related to the circular economy, in this case Ghana's government procurement played an important role. In the early 1980s, the government of Ghana launched a major national initiative to repair all state-owned vehicles, particularly those being used for transporting agricultural commodities such as cocoa and other food crops from the coun-

tryside to urban areas. This work was delivered via the Suame/Kumasi cluster. This demonstrates how policy initiatives promoting circular economy practices in specific industry sectors such as automotive and machinery can also support the growth of other sectors, in this case the agriculture sector.

How can the developed world assist developing countries in adopting the CE?

There is much that developed countries can do. Large multinationals with supply chains in developing countries can work with SME suppliers to create closed loop supply chains. As consumers in Europe, we have to support this and possibly be willing to pay a premium, such as for fair trade products. For example, in Brazil, drinks manufacturer Diageo works with the Vira-Lata Cooperative of former waste pickers to close the loop on their glass bottles. Governments can also include the circular economy actively in their official development assistance programmes. So far, the circular economy is almost entirely absent from development cooperation, the SWITCH-Asia Programme being a noteworthy exception. Tearfund is actively engaging government departments and non-profit development organisations on this topic.

Lastly, can you elaborate on whether and how the CE is conducive to achieve the Sustainable Development Goals?

This is a new area of research we are looking into at the Institute of Development Studies. Our initial findings show that circular economy practices are very relevant to achieving many of the targets under the SDGs. An example is the target 3.9 that aims to reduce substantially the number of deaths and illnesses from hazardous chemicals and air, water and soil pollution and contamination by 2030. Without scaling-up of circular economy practices across many sectors, it will be difficult to achieve this target.

Another example is target 6.4 that aims to increase water-use efficiency substantially across all sectors and substantially reduce the number of people suffering from water scarcity by 2030. Circular economy principles and practices for re-use and recycling of water in industry and households are key to achieving this target. Finally, circular economy practices are key to achieve various targets of the Goal 12 on Sustainable Consumption and Production. In our on-going research, we will investigate how circular economy practices can resolve tensions between some of the SDG targets, such as the goals for food, water and energy, in specific country contexts.

At a headline level, too, the circular economy addresses the tension at the heart of the SDGs between lifting more people out of poverty (which requires economic growth) and protecting the planet (which is damaged by our current growth model).

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Circular economy is happening in Asia!



By Sara Castro-Hallgren and Liazzat Rabbiosi

By 2030, Asia is projected to account for two-thirds of the 4.9 billion global middle class population, who will have a larger disposable income to drive consumption, with consumer spending predicted to reach USD32 trillion.¹ Increasing consumer demand and spending will further deplete the planet's resources, especially in light of rising populations, rising incomes, and an increasing number of consumers with unsustainable lifestyles based on a 'throwaway culture' or 'fast fashion' for example.²

Today, countries can no longer afford to follow a linear model of production and consumption (extensive use of natural resources and planned obsolescence) and can instead grow sustainably through more sustainable principles, such as those of the circular economy. A circular economy is designed to use fewer resources, generate less waste, increase value captured in supply chains, and make sure all 'waste' becomes a valuable resource within an economic process. The circular economy complements and forms an integral part of

existing thinking on uncovering pathways to an inclusive green economy, founded upon improving patterns of sustainable consumption and production to transition towards sustainable development.

Achieving this switch requires a change in different parts of the overall socio-economic system: policies, production practices, and consumption habits enabling a decision-maker – whether a policymaker, farmer, entrepreneur, or consumer – to think and act in a circular manner!

Economies and business sectors that are early adopters of public policies and business strategies supporting a circular economy model can only earn more value from increased productivity and competitiveness.³ For example, the economic benefits associated with the implementation of a circular economy in the EU promises “a net economic benefit of EUR1.8 trillion by 2030”.⁴

In practical terms, the implementation of a circular economy can take place at four levels, the examples of which can be found in projects implemented under SWITCH-Asia⁵:



Cities and communities:

closed loops in urban services, such as wastewater treatment, can generate value from waste;



Industrial clusters:

eco-industrial parks can adopt industrial symbiosis approaches through servicing multiple companies simultaneously with waste to resource facilities and more;



Businesses

through resource efficient and cleaner production, effective adoption of sustainability standards in production to ensure product lifetime extension for example, and ensuring closed loop production practices across their supply chains;



Households and consumers

behavioural changes ensuring greater household recycling and consumer purchases of certified products.



“Enterprises and public institutions shall set up management systems and take measures to reduce the consumption of resources, reduce the production and discharge of waste and improve the reutilisation and recycling level of waste.”

China’s Circular Economy Law, Article 9

“Citizens shall enhance their awareness of resource conservation and protect the environment, consume resources in a reasonable way and save resources.”

China’s Circular Economy Law, Article 10

Policymakers in Asia have already seen the potential of a circular economy model to contribute to strengthened economic growth and have thus interpreted it into national policy frameworks across the region. Public policies, if effectively implemented, can help ensure this change is made rapidly or taken to scale. China was a first adopter, regulating for a circular economy in 2009. China’s Circular Economy Law is grounded in practical changes to production and consumption process through resource recovery and resource efficiency.⁶ Article 9 notes that “Enterprises and public institutions shall set up management systems and take measures to reduce the consumption of resources, reduce the production and discharge of waste and improve the reutilisation and recycling level of waste”. While Article 10 looks at consumer behaviour to report wastage and change their actions, “Citizens shall

enhance their awareness of resource conservation and protect the environment, consume resources in a reasonable way and save resources.” For some Asian countries, a circular economy is also rooted in national culture – even if this is not explicitly termed ‘circular economy’. People in Asia have long been reusing, repairing, sharing and upscaling products in what is now seen as advanced models of circular economy. These resource-efficient traditions and philosophies underpin many national development strategies. Thailand, for example, has adopted a national sufficiency economy philosophy in its development plans since 1997⁷. With each National Economic and Social Development Plan, this philosophy, first advocated by the late King Bhumibol in 1974, gained prominence in its application to production processes, from agriculture to cement manufacturing.⁸

4) McKinsey and Co., September 2015, Europe’s Circular Economy Opportunity, Online at: <http://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/europes-circular-economy-opportunity>

5) Murray A. et al, the Circular Economy: an Interdisciplinary Exploration of the Concept and Application in a Global Context, 2013 Journal of Business Ethics

6) World Bank, 2016, China’s Circular Economy Promotion Law came into force in January 2009 (the word „circular“ in the title is essentially synonymous with „sustainable“). The Law is formulated for the purpose of facilitating circular economy, raising resources utilisation rate, protecting and improving environment and realising sustained development. http://ppp.worldbank.org/public-private-partnership/sites/ppp.worldbank.org/files/documents/China_CircularEconomyLawEnglish.pdf

7) <http://unesdoc.unesco.org/images/0022/002230/223026E.pdf> The King’s statements zeroed in on the need for all members of the nation – government officials, intellectuals and business people – to “develop their commitment to the importance of knowledge, integrity and honesty, and to conduct their lives with perseverance, toleration, wisdom and insight, so that the country has the strength and balance to respond to the rapid and widespread changes in economy, society, environment and culture in the outside world”.

8) ibid

In production policies, countries have also initiated regulatory measures to ensure a circular economy and closed loop systems. India, for example, enacted an e-waste law, which aims for circular economy models to manage the rising tide of electronic waste. The Ministry of Environment, Forest and Climate Change adopted this new law on 23 March 2016 establishing Extended Producer Responsibility (EPR) in the sector of electrical or electronic waste (e-waste) (G.S.R. 338(E)). This law places new and more stringent responsibilities on manufacturers, producers, collection centres, dealers, e-retailers, refurbishers, consumers, bulk consumers, dismantlers and recyclers involved in the manufacture, sale, transfer, purchase, collection, storage and processing of e-waste. It provides for the collection and channelisation of e-waste generated from 'end-of-life' products and for the pre-treatment of e-waste to immobilise mercury and to reduce the volume of waste prior to disposal or storage. Under this new law, consumers

have the obligation to ensure that the e-waste generated by them is channelled through the appropriate collection centres, dealers, dismantlers or recyclers.⁹

It can be said that the SWITCH-Asia project *WEEE Recycle* played a key role in advocating this policy change in India. The UN Environment Programme, through the SWITCH-Asia Regional Policy Support Component (SWITCH-Asia RPSC), is supporting a circular economy through its ASEAN Policy Roadmap for Energy Efficient and Renewable Energy Technologies¹⁰, which will be launched in December 2016. This policy roadmap calls for policies central to achieving a circular economy, such as EPR for greater waste management-oriented supply chains, ensuring that product lifetimes are regulated optimally and increasing public-private sector focus on renewable energy sources through a circular economy.

The SWITCH-Asia RPSC has also included the concept of EPR into the current Environment Governance Reform

that the Kingdom of Cambodia¹¹ is undertaking, to ensure greater take-back mechanisms and resource recovery efforts in environmental laws and policies. Through the support of the SWITCH-Asia RPSC, the 10-Year Framework of Programmes on SCP (Consumer Information Programme) works with countries, such as Indonesia, to advocate greater circular economy policies in the plastics and packaging sectors through resource recovery, Product Information Disclosure and Product Lifetime Extension. The SWITCH-Asia National Policy Support Component of Indonesia highlights that Indonesia has a law in place to minimise waste through circular economy policies (Act 18/2008, PP 81/2012), promoting concepts such as 3R, and EPR at national and sub-national levels.¹² This law now requires greater implementation and enforcement, especially in plastic packaging, as Indonesia is one of the top five marine plastic polluting countries, all of which are in Asia.¹³



It can be said that the SWITCH-Asia project WEEE Recycle played a key role in advocating this policy change in India.



The pictures are made available by the WEEE Recycle-project.

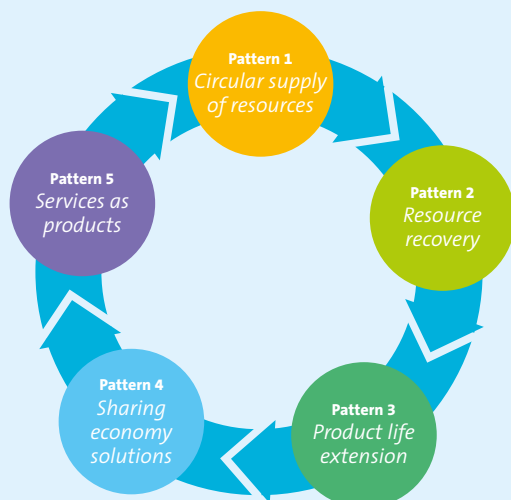
⁹ SWITCH-Asia National SCP Policy Profiles, India. Available at: www.switch-asia.eu

¹⁰ <http://www.switch-asia.eu/news/switch-asia-and-the-international-copper-association-enter-into-a-cooperation-agreement-to-accelerate/>

¹¹ <http://www.unep.org/stories/Governance/Cambodia-overhaul-entire-system-environmental-governance.asp>

¹² SWITCH-Asia Mapping the State of SCP Policies and Tools in Indonesia, 2013. Online at http://www.switch-asia.eu/fileadmin/user_upload/Final_Baseline_Study_Indonesia_.pdf

¹³ McKinsey and Co. Stemming the Tide: Land-based Strategies for a Plastic-Free Ocean. September 2015. Online at: <http://www.mckinsey.com/business-functions/sustainability-and-resource-productivity/our-insights/stemming-the-tide-land-based-strategies-for-a-plastic-free-ocean>



Five sustainable consumption and production patterns for a circular economy

Conclusion

Moving towards a circular economy is essential to meet the Sustainable Development Goals amid growing scarcity of natural resources and growing populations, especially in Asia. However, the full potential value of the circular economy goes well beyond simply waste to resources or recycling efforts, which are already taking root through various policy initiatives demonstrated above. Circular economy also implies a radical rethinking of product design and lifespan extension activities along the value chain, such as repairing, reusing, refurbishing, reconditioning and remanufacturing and requires the engagement of consumers as part of value chain to enable such circularity of resources. While the initial seeds are planted through Asia's traditions, policy advancements and business cases, current consumer and producer behaviours and practices must shift through policy leadership and greater political will for a circular economy. Lastly, education systems need to build knowledge and skills for a circular economy mindset and consumer awareness should be prioritised to increase public understanding of the value of retaining some existing practices of sharing, repairing and reusing and the need for mainstreaming circular economy in society.

Through SWITCH-Asia's policy support to Chinese government institutions on policies for sustainable value chains in textiles, policy dialogues have also been hosted with European Cities and institutions, such as Borås, Sweden to transfer knowledge on closed-loop wastewater management systems¹⁴. There are ample European cases of national to local policy leadership that can provide solutions for Asian cities through increased policy dialogue between Asian and European local governments. The UNEP International Environmental Technology Centre also works to develop localised waste management strategies and solutions across the Asia region, but with greater support, more city-to-city cooperation in these efforts could be developed in the future for observable local industry changes.

Lastly, but perhaps most importantly, the UN Environment Programme is also leading work on promoting and embedding a circular economy directly with industries and business through projects such as eco-innovation working with SMEs in Malaysia, Sri Lanka and Vietnam. The approach of eco-innovation

helps ensure a circular economy through use of business strategies and business models from the start. An extensive analysis of more than 120 case studies by Accenture in 2014 revealed five main business model patterns that follow a circular economy, briefly summarised in the figure below.¹⁵ UN Environment's Eco-innovation Manual¹⁶ and its methodology on generating new business models for sustainability provides a more in-depth overview of these cases and how to 'do sustainability' in a practical way in a company and, through its value chain, towards circular economy solutions.¹⁷

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¹⁴ <http://www.unep.org/stories/SustainableDevelopment/Swedish-textile-city-Boras-fashions-itself-Viskan-River-anew.asp>

¹⁵ Accenture (2014). Circular Advantage Innovative Business Models and Technologies to Create Value in a World without Limits to Growth. URL: <https://www.accenture.com/gb-en/insight-circular-advantage-innovative-business-models-value-growth>

¹⁶ <http://web.unep.org/ietc/>

¹⁷ For more information on the UN Environment Programme's Eco-Innovation Manual and Tools please visit: <http://www.unep.org/resourceefficiency/Business/Eco-Innovation/TheEco-InnovationProject/Eco-innovationManual/tabid/1059803/Default.aspx>

Reducing plastic bag waste in major cities of Cambodia



By Claudia Oriolo



Thang rikreay – happy bag

The Earth Policy Institute estimates that three billion bags are consumed globally each day. This equates to one trillion bags per year, with a significant portion ending up in our oceans. The magnitude of the plastic bag waste problem is immense, but there is growing recognition that every country needs to address this issue as part of an international effort to protect the environment. Good examples of plastic bag reduction programmes, no longer limited to Western countries, can be found in Rwanda, Uganda, Tanzania, China, India, Bangladesh and Bhutan. Despite these efforts, Asia has been named the world's top ocean plastic polluter¹. Asia includes the countries that contribute the majority of plastic waste to the oceans, namely: China (1st), Indonesia (2nd), Philippines (3rd), Vietnam (4th), Thailand (6th) and Malaysia (8th).

Rapid economic growth and increased consumer demand for safe, disposable products, coupled with inadequate solid waste management systems, are key reasons for plastic littering of the environment. Although a small player compared to its neighbours, Cambodia's growing economy, paired with its limited capacity to manage plastic waste, puts the country in a critical position to curb its plastic bag use and find adequate solutions for its disposal. Consumption of plastic bags in Cambodian cities is extremely high: research conducted by the SWITCH-Asia project "Reducing plastic bag waste" estimates that an urban Cambodian consumes some 2158 plastic bags per person per year, and up to 2700 in the case of housewives. Plastic bags are used for everything, ranging from protecting clothes from dust and rain, to acting as beverage containers paired with a straw.

In November 2015, the SWITCH-Asia project conducted a survey², engaging with 606 vendors, that indicated the following major patterns:

1. on average, housewives use 5 or 6 bags per shopping journey, thus receiving nearly 27 bags per week from markets alone. Some vendors provide up to 2-3 kilos of bags a day, which quickly adds up to about USD 20/week;
2. over 50% of all plastic bags are acquired at markets, 'wet' markets in particular;
3. traditional eco-alternatives, such as banana leaves and lotus leaves, are no longer cheap or practical (their use is limited to food products where there is a specific functional attribute, such as taste);
4. other eco-alternatives, such as bio-degradable bags or fabric bags, are still expensive and not price-competitive in Cambodia and thus face limited market opportunities.

There is minimal production of plastic bags within Cambodia. While measuring impact with a lifecycle approach requires end to end estimations, the absence of manufacturing (of plastic bags) in Cambodia limits the local impact that may be considered from production. Most plastic bags used in the country are imported from Thailand and Vietnam. In addition, there is the challenge of availability of data on trade and other commercial activities. There is an acknowledged part of the economy that is undocumented and, thus far, there have been limited studies focused on plastic bags in Cambodia. Disposal systems have both a formal and informal component. Litter is a visible problem of a dysfunctional collection and disposal system. In cities, waste collection is managed by professional private-sector enterprises that offer services to households and businesses on a monthly fee basis. Working alongside

is the informal sector, which largely focuses on collection of recyclable waste. Plastic bags are collected through both these systems (though recycling is rare) and are also a major component of the litter or uncollected waste problem.

In this context, Fondazione ACRA developed the SWITCH-Asia project "*Reducing Plastic Bag Waste in Major Cities of Cambodia*", which is implemented in collaboration with the Phnom Penh Capital Department of Environment (DOEPP) and the Royal University of Phnom Penh (RUPP). The project encompasses the following three main pillars:

- **Behavioural Change Campaign (BCC):** conduct a behavioural change communication campaign that helps consumers in major Cambodian cities to adopt sustainable behaviour regarding use of plastic bags;
- **Design alternative systems for packaging and plastic waste disposal:** meet the packaging needs of consumers and retailers in major Cambodian cities by designing and providing eco-friendly alternatives that are viable, visible, accessible and affordable;
- **Policy Formulation:** accompany the efforts of the Ministry of Environment to create an appropriate policy and regulatory framework to minimise waste impact from plastic bag consumption and production. The Ministry of Environment, Cambodia (MoE), the Phnom Penh Capital Department of Environment (DoEPP), the Royal University of Phnom Penh, and ACRA are collaborating on this effort.

An overarching strategy for tangible impact

To address all the different dimensions of the problem, the SWITCH-Asia project designed a human-centred methodology

to identify and tackle the most relevant focus areas, target groups and behavioural changes associated with the large-scale consumption of plastic bags.

Focus area: local wet markets, with a special emphasis on women. In terms of scale, in Cambodia, wet markets are by far the biggest distributors of plastic bags to consumers, providing 50% of all bags received by consumers (an average of five plastic bags per visit). This is almost twice as many bags as *chab houys* (street retail stores) and street food vendors who provide two to three bags per visit. Housewives and female vendors are by far the main protagonist of the wet market scene, which makes them the obvious target for any intervention addressing plastic bag consumption. The behavioural change campaign is being rolled out in eight markets in Cambodia's major cities: five in Phnom Penh, two in Siem Reap and one in Sihanoukville.

Selected behaviour to encourage: consolidation, i.e. combine more purchased items in a bigger bag. Based on a human-centred design methodology, ACRA developed a comprehensive communication campaign in the attempt to confront the problem at its source. Entitled "Combine in One", and in order to reduce plastic bag consumption by promoting consolidation of purchases into larger bags, a set of activities was tested and refined in the pilot market of Pshar Loo in Phnom Penh in August 2016. The activities included capacity building of vendors, activation of markets, a number of incentives targeting consumers as well as vendors, and the promotion of large branded bags to be used as exemplifiers of positive behaviour. The project-branded *Thang Rikreay* "Happy Bag" are large bags (5kg) that have been designed as a tool to reinforce the campaign messages and which can help vendors in their efforts to promote consolidation of purchases

2) http://www.switch-asia.eu/fileadmin/user_upload/Project%20news/Plastic_bags/Market_Research_Report.pdf



into larger bags. The purpose of the bags is to promote the use of 5 kg bags at markets and replace the smaller, more polluting bags. In order to make these bags available for vendors and consumers, different models of distribution were tested during the pilot. The project engaged plastic bag distributors to sell bigger bags to vendors and tested how responsive distributors and market vendors were when asked to use and sell only bigger bags instead of small ones. The official launching ceremony of the Behavioural Change Campaign was held in Phnom Penh on 14 October 2016 with the attendance of nearly 70 participants, including the press and media.

Activation in the markets: activation consists of engaging consumers to encourage awareness, “noise” and excitement in the targeted markets. In the implementation, ACRA encourages sustainable behaviour by using compelling tailor-made visual tools – like banners and posters etc. – as well as by performing activities on the

ground with the support of professional activators. Among most prominent visual features, a “Fruit Lady” was chosen to be the ambassador for the entire campaign. She appears in all communication material and comes alive as a member of the activation team.

Set of incentives for consumers and vendors: in order to incentivise both vendors and customers to adopt the consolidation approach, a set of awards (such as crayons, pens, big woven bags, blenders) for positive behaviour has been developed. With the direct involvement of professional activators and the market team, a number of these incentives was tested at the pilot stage, for instance a lucky draw, a wheel of fortune and a Facebook photo contest. In order to identify top performers, a mystery shopper mingles among regular customers in local markets; best-performing vendors and consumers are then awarded with prizes and certificates, issued on behalf of ACRA.

First data: promising results: in August 2016, the campaign was first piloted at Psar Loo, a local wet market close to the Olympic stadium in Phnom Penh. Despite initial challenges that led to refined and better-tailored training and activation schemes, the first evidence shows promising results. In Psar Loo, around 136 vendors were trained and responded very positively to the requests and messages. As an outcome of the pilot, usage of plastic bags reduced by 20.8% on average, with a reduction in weight per day of nearly 18.48 kg. In terms of the reduction in the number of plastic bags, data show a daily decrease of 5940 bags, representing 26.5%. The first BCC targeted spot was Orussey Market in Phnom Penh. In this context, ACRA succeeded in training 137 vendors, reducing use of plastic bags by 35.7% in numbers and 27% in weight. Out of all trained vendors, 29.4% of them reduced 50% of plastic bags by weight, and 31.4% reduced use by 50% in terms of number used.

Media and Communication: as part of the wide-ranging communication campaign, a TV commercial and two viral videos were filmed, all related to “Combine in One” messaging. The three videos focus on the promotion of combination behaviour to reduce plastic bag consumption. A fruit lady appears as the main character and is seen promoting the combination of purchases in different contexts. The TV commercial is aired nationwide on major TV channels. Concurrently, a Facebook page was set up and other social media platforms, such as Instagram, Vimeo and Twitter, are being used for broader outreach and to attract younger generations.

Policy Formulation: ACRA has been working on the policy side by providing studies and policy tools to the Ministry of Environment. As a result, an Inter-Ministerial Technical Working Group (ITWG), comprised of the Ministry of Environment, the Ministry of Interior, the Ministry of Economy and Finance and the Ministry of Tourism, was officially established in June 2016 to develop a regulatory framework on plastic bag reduction. Following its establishment, the ITWG organised five meetings at the Ministry of Environment. The Prakas (proclamation) was identified as the

appropriate regulatory instrument to set standards on plastic bag reduction. The first draft of the Prakas took into account recommendations provided by ACRA which related to banning small plastic bags, minimum price charges per bag in supermarkets and levies on plastic bag imports. Since July 2016, the drafted Prakas has been upgraded into a sub-decree based on recommendations from the Ministry of Economy and Finance. The ITWG presented the final draft to relevant stakeholders during a national consultation workshop on 10 October 2016, in the presence of the Minister of Environment.

At the time of writing, a last round of contributions for final integrations and amendments is posed to take place, which will eventually culminate in the submission of the draft for Prime Minister’s approval. The Ministry of Environment (MoE) intends to have it enacted by end-2016. Furthermore, ACRA has been actively involved in a consultative process aimed at developing a comprehensive Environmental Code at the MoE level and with the support of the UN Development Programme (UNDP). Most recently, ACRA has joined a technical roundtable focused on establishing a national solid waste management strategy for Cambodia, together with

relevant stakeholders and specialised agencies, and under the supervision of the United Nations Environment Programme (UNEP).

Education in Primary Schools: ACRA has been collaborating with the National Committee for Clean City Assessment (NCCA) to conduct activities at twenty primary schools in target cities (Siem Reap, Sihanoukville). Such activities include the promotion of clean school standards, the setting-up of environmental clubs (“eco-clubs”) and organisation of school carnivals to foster sustainable behaviour and good waste management practice at the school level. Further dissemination, awareness-raising and outreach initiatives will take place to engage with students and families actively.

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BCC banners and signals

Developing eco-labelling for the leather footwear sector in Bangladesh

By Ainara Garcia Uriarte and Javier del Pozo

Eco-labelling is a voluntary certification method that measures the environmental impact of a product or service. The International Standards Organisation (ISO) has classified existing environmental labels into three typologies – Type I, II and III – and has specified the preferential principles and procedures for each (ISO 14020 series).

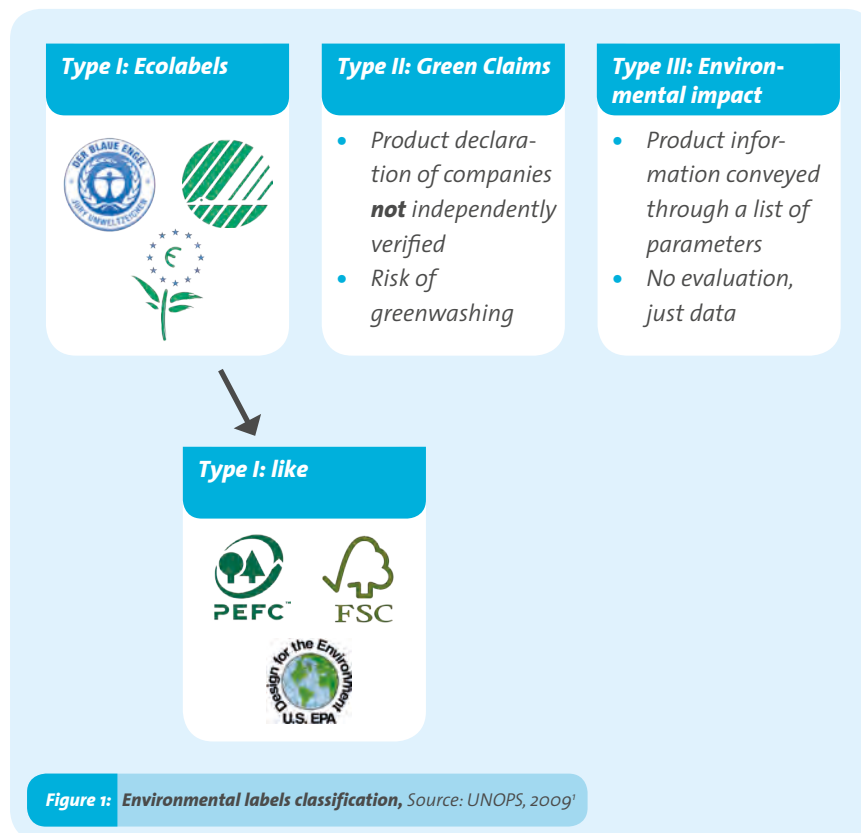
Eco-labelling and the circular economy

Eco-labels promote the transition to a circular economy, supporting both sustainable production and consumption. As recognised in the 2014 European Union's scoping study to identify potential circular economy actions, priority sectors, material flows and value chains, the eco-label is one of the information tools that supports the circular economy.

Thanks to eco-labelling, consumers can make informed choices. Domestic and international consumers increasingly purchase products that meet their preferences for quality, eco-friendliness and sustainable production. The need for simple, reliable and unambiguous

information about products has become a consumer demand. Misleading, meaningless or unclear information can result in consumers losing confidence in en-

vironmental claims and labels, leading to unfair business competition and discouraging companies from making truthful claims, which often happens.



to Savar, a new industrial park created specifically to accommodate tannery industries and offering better environmental facilities, including an Effluent Treatment Plant (ETP).

The SWITCH-Asia project *ECOLEBAN* (2014-2018) aims at enhancing the resource efficiency and sustainability of the leather sector in Bangladesh throughout the whole value chain of leather-related products, such as footwear and other leather goods, by increasing the number of less polluting SMEs. This will be achieved by implementing Sustainable Consumption and Production (SCP) practices, Environmental Management Systems (EMS) and eco-labelling schemes in SMEs. Additionally, *ECOLEBAN* approaches policy makers and financial institutions to promote favourable legislation and make finance accessible to cleaner SMEs.

The *ECOLEBAN* Project is being implemented by Fundación Tecnalia Research & Innovation (TECNALIA), Bangladesh Finished Leather, Leather goods and Footwear Exporters' Association (BFLFEA), Bangladesh Tanners' Association (BTA) and Leathergoods & Footwear Manufacturers' & Exporters' Association of Bangladesh (LFMEAB).

Bangladesh has limited EMS experience, and lacks experience in eco-labelling. One of the main expected outcomes of *ECOLEBAN* is the design and



development of an eco-label scheme for the Bangladeshi leather footwear sector, similar to those existing in neighbouring countries (such as the eco-mark in India, Korea eco-label, etc.) and the preparation of 20 leather footwear manufacturing SMEs to obtain the eco-label as a pilot process.

The implementation of eco-labelling schemes in the Bangladeshi leather footwear sector will enhance the companies' visibility, exportability and penetration of their products into national and international markets, thus improving their overall competitiveness.

The adoption of the eco-labelling schemes for the leather footwear, together with the leather sector's environmental reforms initiated two years ago

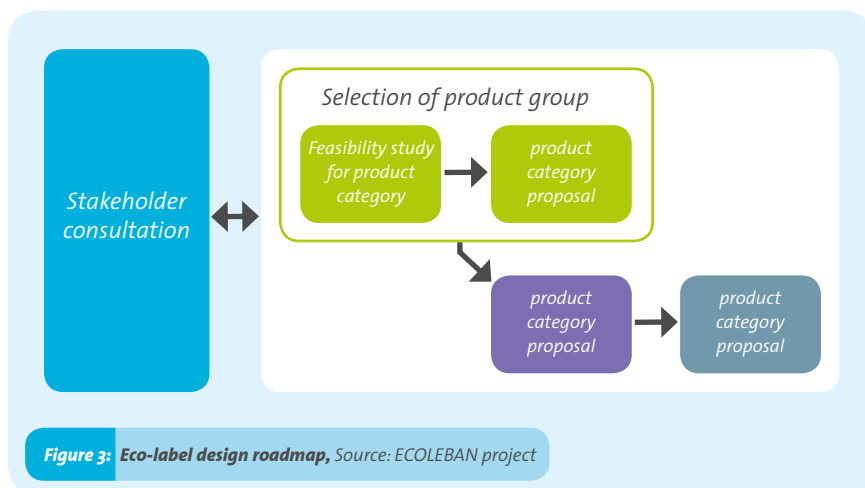
and the building of the new industrial park in Savar, represent a great opportunity for the sector's development and for international recognition of eco-friendly leather production.

The eco-labelling process for leather footwear in the *ECOLEBAN* project

The following roadmap presents the steps followed by the *ECOLEBAN* project on the process to developing an eco-label for Bangladeshi leather footwear manufacturers:

1. Stakeholders' consultation

Stakeholder consultation is a continuous process required in the eco-label design roadmap in order to take into account the most relevant opinions of consumers and stakeholders within the leather value chain in Bangladesh. The *ECOLEBAN* consultation was undertaken through surveys with domestic consumers in order to gain in-depth analysis of Bangladeshi consumer constraints and limitations to buying sustainable products. A 17-question survey distributed among the consumer groups (low-income, medium-income, high-income consumers and university students) garnered information regarding consumer perception of green products and eco-labelling, as well as



gathering comments and suggestions. For this purpose, 353 interviews were conducted with citizens in Dhaka, in two differentiated zones (the market-place area and the university area).

The main results of this survey are:

- price is the most important factor when making a decision on what products to buy (for low and medium income groups), followed by quality and environment friendliness, although consumers would not pay more than 10% extra for an environmentally friendly product;
- producers should make more efforts to produce environment-friendly products;
- the Government should reduce taxation for more environment-friendly products and increase taxes for those that damage the environment;
- respondents would trust the environmental performance of Bangladeshi products through certification by a Bangladeshi label.

Two workshops were also organised with Bangladeshi consumer associations and trade associations of SMEs (such as the SME Foundation Bangladesh). The main outcomes of these workshops were:

- increased consumer awareness via seminars, campaigns, workshops, advertisements and other marketing

and dissemination materials;

- involvement of certification bodies is very important in the sustainability of project results;
- manufacturers can play a key role in their production processes to incorporate green practices,
- manufacturers play a key role in the manufacturing of green products.

As a result of the consumer consultation, dissemination campaigns on the benefits of the green products for the domestic market should target lower income groups in order to promote consumption of green products locally. At the same time, the Government should assure fair business competition by reducing taxes for more environment-friendly products and increasing taxes for those that damage the environment.

ECOLEBAN also consulted SMEs in the Bangladeshi leather sector, retailers and other commercial agents, policy makers responsible for policy formulation and implementation, certification bodies, and SME associations in order to understand stakeholders' view of the Bangladeshi eco-label for leather footwear as well as potential synergies and conflicts. A survey was conducted via a questionnaire during stakeholder round tables and workshops held in Dhaka in September 2015.

The main benefits identified by the leather stakeholders of the adoption of the eco-labelling scheme are:

- an increase in competitiveness of the Bangladeshi leather sector in the global leather market;
- market development, meaning easier access to global markets;
- attracting new international buyers, resulting in satisfaction of domestic and international consumer demand;
- environmentally friendly production, a reduction in pollutants and an increase in healthy lifespans for citizens;
- encouragement of continuous manufacturing improvements;
- improvement in the international branding of Bangladesh as a producer of quality and eco-friendly products;
- promotion of environment-friendly certification.

2. Feasibility study for product category

In this second step, ECOLEBAN conducted a study to provide preliminary information to support the development of the ECOLEBAN eco-label scheme. The purpose of the study was to consider the feasibility of establishing product categories, in this case, for leather footwear.

The feasibility study, based on bibliographic research, focused on the following topics:



"Consumer's Perception of Green Products and Ecolabelling" workshops



Life cycle stage	Criteria
Input materials	<ul style="list-style-type: none"> • <i>Origin of hides and skins</i>
Use of chemicals	<ul style="list-style-type: none"> • <i>General exclusions</i> • <i>Special substance requirements</i>
Use-product parameters (Serviceability)	<ul style="list-style-type: none"> • <i>Durability</i> • <i>Packaging</i> • <i>Information to the consumer</i>

- detailed study of the Bangladeshi leather value chain, focusing mainly on footwear manufacturing;
- available legislation on eco-labels: European policy and legislation, Bangladeshi policy and legislation, other countries' legislation, international standards;
- international eco-labels already available;
- market analysis within Bangladesh;
- technical analysis of the life-cycle assessment of leather footwear.

As a result of the feasibility study, the leather footwear sector was chosen due to manufacture and sales volumes, export predictions and market access. However, project results, such as the product categories required for setting up an eco-label, could easily be replicated to other leather goods or to any other important product category in the Bangladeshi market. *ECOLEBAN* will also strive to develop an eco-label for “footwear or shoes designed to protect or cover the feet with an upper of leather”.

Taking into account that 20% of Bangladeshi leather footwear exports go to Germany and 18% to Japan, the criteria within the established eco-labels of these countries were considered in the development of the *ECOLEBAN* eco-label.

3. Product category proposal

The third step, a product category proposal, was prepared for policy makers, SMEs, SME associations, certification

bodies, universities and consumers in the leather footwear value chain. The proposal investigated the market and operational and sustainability aspects of the “footwear or shoes designed to protect or cover the feet with an upper of leather” (identified in the Feasibility Study as the object of the eco-label to be developed in the *ECOLEBAN* project), with the goal to develop a robust evidence base and to prioritise key environmental issues to support the development of eco-label criteria.

The product category proposal consisted of an analysis of the scope, definitions and description of the legal framework (product characterisation); market analysis for the footwear product group; an overview of existing technical life-cycle assessment studies; and analysis of the significant environmental impacts of footwear (technical analysis). Combined with input from stakeholders, this information has been used to determine improvement potential and will be used for the next steps of the eco-label development process.

The proposal concludes that the life-cycle stage with the largest adverse environmental impact is the production of the leather required for footwear manufacturing. In addition, chemicals and other materials used during the production processes generate significant detrimental environmental impacts. Therefore, the eco-label criteria also need to relate to improvement potential in these areas.

4. Selection of environmental criteria

The fourth step, recently finished, aims to establish environmental criteria based on the information analysed in the product category proposal. The origin of hides and skins, the use of chemicals, durability, packaging and consumer information are some of the identified criteria.

5. Reporting and publication

The fifth step will be publication, by the end of 2016, of the new eco-label specifications on the websites of the *ECOLEBAN* project and associated partners. The project is encouraging national standard organisations to continue and to take over their initiative related to certification.

Over the latest months, the project has identified and selected 20 footwear manufacturing SMEs from the members of the LFMEAB and BFLFEA associations, to start the pilot in assisting them to obtain certification by next year.

The results from these pilot SMEs will be disseminated among *ECOLEBAN* stakeholders in Bangladesh as case studies in order to encourage other leather footwear SMEs to adopt the eco-label for their products. For this purpose, guidelines for the implementation of eco-labelling schemes in SMEs of the footwear sector in Bangladesh will be elaborated within the framework of the *ECOLEBAN* project.

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ASEAN SHINE project paves the way for energy efficiency in Southeast Asia

By Pierre Cazelles and Jonathan Duwyn

In the ten member countries of the Association of Southeast Asian Nations (ASEAN), inefficient air conditioners and their growing number lead to excessive electricity consumption resulting in unnecessarily high greenhouse gas emissions. Switching to energy efficient air conditioners could save up to 14.3 TWh, avoid 10.5 million tonnes of CO₂, and allow financial savings equivalent to 1.8 billion USD by 2030. Harmonising energy efficiency standards for air conditioners in the region is the most cost-effective way to transform the ASEAN market to energy-efficient air conditioners.

The SWITCH-Asia project, *ASEAN SHINE* (2013–2016), aimed at increasing the market share of more efficient air conditioners in ASEAN through the harmonisation of test methods, the

adoption of common minimum energy performance standards (MEPS), and changing consumer behaviour towards purchasing energy-efficient appliances.

ASEAN SHINE is a public-private partnership between the International Copper Association, the UN Environment Programme (UNEP), and four in-country partner organisations: SIRIM in Malaysia, the Research Centre for Energy and Environment (RCEE) in Vietnam, the Electrical and Electronics Institute (EEI) in Thailand, and the Integrated Institute of Electrical Engineers (IIEE) in the Philippines.

The *ASEAN SHINE* project fitted within the framework of the strategic objectives of the ASEAN Plan of Action for Energy Cooperation (APAEC) and Action Plans and Initiatives of sub-sector networks and specialised energy

bodies for the APAEC 2016-2025: Phase I (2016-2020). APAEC is the energy component of the ASEAN Economic Community Blueprint 2015, which directs ASEAN towards achieving energy security and sustainability for the region.

In its fourth programme area on energy efficiency and conservation, APAEC defines the development of energy efficiency policy and capacity building, as well as awareness-raising and dissemination of information as strategic objectives. Ownership for these objectives is allocated to the ASEAN Energy Efficiency and Conservation Sub-Sector Network (EE&C-SSN), with the ASEAN Centre for Energy (ACE) as the Secretariat.

Establishing policy frameworks for promoting energy efficient air conditioners

Since its inception in 2013, *ASEAN SHINE* has led the ten ASEAN countries to harmonise energy performance testing methods for air conditioners to ISO5151:2010 with financial support from APEC and the European Union. This means that a single standard is now applicable across ASEAN countries to test the energy efficiency of air conditioners, reducing the cost of compliance for air conditioner manufacturers and paving the way for future harmonisation of energy performance standards in ASEAN.

The ASEAN Ministers of Energy Meeting (AMEM) endorsed the “ASEAN Regional Policy Roadmap for Harmonisation of Energy Performance Standards for Air Conditioners” in October 2015. The objectives of the policy roadmap are to “provide clear guidelines in the adoption of policies to promote the use of more efficient air conditioning equipment and define the targets to be achieved by all ASEAN countries with regards to the adoption of harmonised energy performance standards of ACs by 2020”. The “ASEAN Regional Policy

Roadmap for Harmonisation of Energy Performance Standards for Air Conditioners” specifies that the ASEAN countries have agreed to accept a uniform testing method derived from ISO 5151:2010 and that this agreed testing method is to be adopted and notified by countries by 2016, with the exception of Cambodia, Laos, Myanmar for which it is to be adopted and notified by 2018.

The ASEAN ministries in charge of energy are now developing their national policy roadmaps, to be adopted officially by the end of 2016.

The *ASEAN SHINE* project for air conditioners also built capacity of testing laboratories regarding the new testing standards and that of local air conditioner manufacturers for designing more highly efficient air conditioners. National consumer awareness campaigns were also launched in Indonesia, Thailand, Philippines, Vietnam and Malaysia in October 2016, with *ASEAN SHINE* Air Conditioner Selection software and application, and achieved through training sales persons in retail chains and via online promotion.

The establishment of *ASEAN SHINE* has been made possible with a grant from the European Union’s SWITCH-Asia Programme totalling EUR 1.7 million, which ends in December 2016. *ASEAN SHINE* has proven to be a very effective tool in implementing actions meeting ASEAN member state objectives in terms of advancing energy efficiency for air conditioners.

The International Copper Association funds and operates the *ASEAN SHINE* Programme Management Office, with an office in Bangkok and country managers in Indonesia, Malaysia, Vietnam and the Philippines.

The ASEAN Centre of Energy ensures effective engagement and liaison with the different ASEAN-level regional forums, including the EE&C-SSN, SOME and AMEM.

Expanding ASEAN SHINE to additional appliances

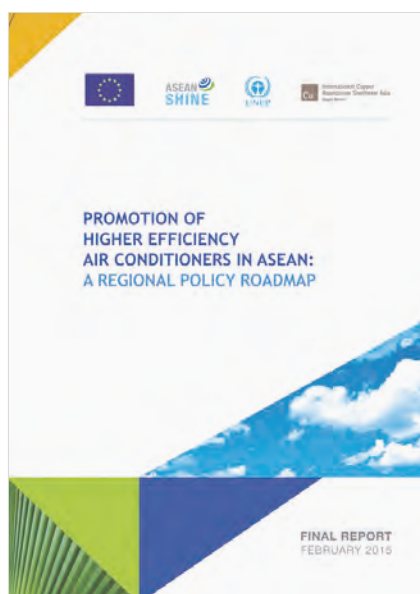
In April 2015, representatives of the energy agencies of the ten ASEAN member countries agreed to work together on the development and implementation of regionally-harmonised standards and policies for lighting. The UN Environment Programme enlighten initiative – which is now integrated into the United for Efficiency (U4E) initiative – was identified to support ASEAN countries in this exercise, in close collaboration with the ASEAN Centre for Energy (ACE) and the International Copper Association (ICA), under the framework of *ASEAN SHINE*.



The *ASEAN SHINE* – Lighting project was launched

officially in Bangkok in February 2016 back-to-back with the *ASEAN SHINE* steering committee meeting. The objective is to harmonise relevant test and performance standards for lighting products among ASEAN member states, as well as to establish robust supportive policies. The project follows the model and approach that was developed and implemented for the Harmonisation of Energy Performance Standards for Air Conditioners.

Immediately after the launch of the project, a ‘Lighting Technical and Policy Working Group’ was established, comprising policy and technical experts from the ASEAN member states. Based on the results from the lighting market assessment of the ASEAN region, members prioritised linear fluorescent lamps and non-direction light-emitting diode (LED) lamps for harmonising test and performance standards. LED lamps are a priority for the ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 and linear fluorescent lamps command a large market share across ASEAN – therefore offering high potential for energy efficiency gains.



Support for initiating the *ASEAN SHINE – Lighting* project was received from the Australian Government and the SWITCH-Asia Regional Policy Support Component (RPSC). This initial support permitted the completion of the ASEAN regional lighting market assessment and will enable ASEAN countries to agree on harmonised test standards for lighting products (ongoing) and on an ASEAN Regional Lighting Policy Roadmap for minimum energy performance standards (ongoing). Further funding is needed to support the delivery of the remainder of the *ASEAN SHINE – Lighting* project.

A way forward

With financial support from the UN Environment Programme and the European Union, the *ASEAN SHINE* team is now conducting a scoping study to evaluate energy savings potential, GHG emissions reduction potential, and to identify solutions to support market transformation in ASEAN for refrigerators, transformers and electric motors. This scoping study also includes two renewable energy

technologies: solar PV and solar thermal. This study will help to expand further the scope of *ASEAN SHINE*.

With the end of the SWITCH-Asia grant and the SWITCH-Asia Regional Policy Support Component support in December 2016, it is necessary to adopt a clear strategy to secure funding for the implementation of the action plans that are currently being formulated. In this context, UN Environment Programme, ICA and ACE will continue disseminating the results achieved to date and an *ASEAN SHINE* Advisory Committee has been formed, bringing together influential organisations, in order to: (i) provide technical guidance and advice to the project, (ii) help mobilise resources, and (iii) enhance coordination of the donor community, as well as NGOs and consultancy active in the field of sustainable energy in ASEAN.

The initial members of the Advisory Committee are: the International Energy Agency, the UN Environment Programme, the United Nations Development Programme, the Australian Government (Department of Environment and Energy), Underwriters Labo-

ratories, the Super-Efficient Equipment and Appliance Deployment Initiative (SEAD, represented by the US Department of Energy), the US Department of State, the ASEAN Centre for Energy, and the International Copper Association.

ABOUT

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ASEAN SHINE steering committee meeting for the promotion of energy efficient air conditioners

Photo: ASEAN SHINE project



Benefits of a circular economy in increasing economic values and corporate competitiveness in Vietnam

By Dinh Thao Hoa

The concept of closed-loop production was very popular in Vietnam during the 20th Century, especially in the agricultural sector. At that time, the Vườn (Garden) – Ao (Pond) – Chuồng (Cage) farming model used waste from one activity as input for another activity. For example, organic waste from growing vegetables, such as damaged vegetables, old leaves, etc., was used as animal feed for fish in a pond or for poultry and livestock living in an enclosure (cage).

Nowadays, with all the profound economic, social and cultural changes, Vietnam has been developing away from a low income agricultural economy to become one of the most active processing service providers in the world. This has raised the national income level and population's living standard considerably. However, the fading of environmentally friendly production models (such as the V-A-C) is

one of the downsides of that economic development pattern. As a replacement for such models, the use of chemicals (fertilizers, pesticides) and the application of automatic farming devices have not only broken the natural circle of materials but also generated more waste, even toxic waste, often released into the environment.

Waste generated by industrial activities and urbanisation is one of Vietnam's serious issues. Vietnam has been named as one of the top ten countries in the world with the worst air pollution since 2012¹. On 6 October 2016, Hanoi – Vietnam's capital – was ranked the second worst city in the world in terms of urban air pollution². As a consequence, the number of people suffering from cancer, acute and chronic respiratory diseases and allergic reactions in big cities in Vietnam is increasing. The Hanoi-based Central Lung Hospital said that 95% of patients suffer from chronic obstructive pulmonary disease due to living in a polluted environment, according to a 2013 study³. Another 2013 study by the Vietnam Ministry of Health noted

that of every 100 000 people, 4100 or 4.1% have lung diseases; 3800 contract inflammation of the throat and tonsils; and 3100 have bronchitis. Most worrisome is that people of working age are those most often affected by air pollution⁴.

These shocking data are a result of extreme pollution in the country, which forces Vietnam to transform its production towards cleaner, safer and more sustainable methods to protect both the national environment and the population's health. In this context, a circular economy could be a good solution. In a circular economy, waste from factories becomes a valuable input to other processes – and rather than disposing of defunct products, they could be repaired, reused or upgraded (Preston, 2012). Circular economy strategies could also result in considerable cost savings, increasing the competitiveness of the nation's industry while delivering net benefits in terms of job opportunities⁵. This concept seems to be an essential solution for Vietnam to continue serving the growing energy and resource demands in the domestic

1) According to the 2012 Environmental Performance Index (EPI) released during this year's World Economic Forum in Davos, Switzerland.

2) <http://saigoneer.com/saigon-health/8196-hanoi-s-air-quality-ranked-second-worst-in-the-world-yesterday>

3) The sources of Lung disease - Dr. Dao Bich Van, Dean of Pulmonary rehabilitation department, Vietnam National Lung Hospital, 2013.

4) <http://english.vietnamnet.vn/fms/society/goo26/air-pollution-cause-of-chronic-diseases-in-big-cities-in-vietnam.html>

5) European Environment Agency, Circular Economy to have considerable benefits but challenges remain, 2016.

Business Models

Circular Supplies: Provide renewable energy, bio based- or fully recyclable input material to replace single-life-cycle inputs

Resource Recovery: Recover useful resources / energy out of disposed products or by-products

Product Life Extension: Extend working lifecycle of products and components by repairing, upgrading and reselling

Sharing Platforms: Enable increased utilisation rate of products by making possible shared use / access / ownership

Products as a Service*: Offer product access and retain ownership to internalise benefits of circular resource productivity

* Can be applied to product flows in any part of the value chain

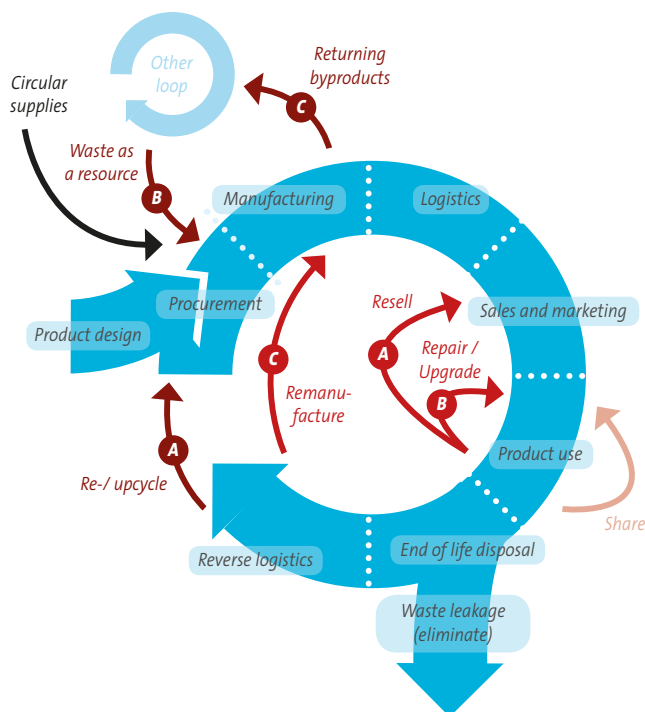


Figure 1: The five business models of the circular economy.

Source: Accenture, Circular Advantage: Innovative Business Models and Technologies to Create Value in a World without Limits to Growth, 2014

market, while decreasing pressure on waste, pollution and climate change.

In research conducted in June 2016 by the Centre for Creativity and Sustainability Study and Consultancy (CCS) with 152 Vietnamese SMEs operating in a variety of sectors, 78.8% of surveyed enterprises stated not to have any idea about the circular economy concept. Only 13.3% of the surveyed firms had some knowledge related to the circular economy, such as sustainable production and consumption, cleaner production, cradle to cradle and resource efficiency. However, in general, Vietnamese SMEs' practice towards applying these concepts in business is still very limited: according to another report conducted by the Vietnam Environment Administration in 2014, only 0.1% (around 200 out of 200 000) of firms all over Vietnam have been applying cleaner production technology in their factories⁶.

The circular economy in Vietnam

Though not many companies are aware of the term circular economy, there are already a variety of circular business models in Vietnam, which have proven not only able to improve firms' economic value and competitiveness, but also able to generate benefits for both society and the environment. According to the report, Circular Advantage⁷, by the National Zero Waste Council Circular Economy Working Group in 2014, there are currently five types of circular business models, see Figure 1. Among them, several have already been applied in Vietnam by SMEs to increase their economic values and competitiveness. This paper presents two case studies of companies that have applied business models of the circular economy in Vietnam.

CASE STUDY 1

Resource recovery: The case of Green Street Trade and Service Joint Stock Company (Green Street JSC.)

Founded in early 2016, Green Street JSC., is an SME located in Hanoi, with two main activities:

- Trading: exporting sustainable and innovative products made from Vietnamese bamboo to Australia, New Zealand and the European Union (EU); and
- Services: consulting on resource recovery processing models and providing commercialisation services for SMEs processing bamboo in Vietnam.

Vietnam has approximately 1.4 million hectares of bamboo growing areas,

6) http://www.unccd.or.jp/content/documents/Country%20Analysis%20Paper_Vietnam.pdf

7) https://www.accenture.com/t20150523T053139_w_us-en/_acnmedia/Accenture/Conversion-Assets/DocCom/Documents/Global/PDF/Strategy_6/Accenture-Circular-Advantage-Innovative-Business-Models-Technologies-Value-Growth.pdf

providing from 12 to 20 tonnes of raw bamboo per hectare per year⁸. However, traditional bamboo treatment methods applied in Vietnam are time-consuming, capital-intensive, affect the environment negatively (by releasing CH₄, CO₂, and SO_x due to the use of sulphur, diesel, and bleach during bamboo treatment processes) and are detrimental to health.

Understanding the existing environmental problems of the current bamboo processing industry, in April 2016, Green Street JSC., provided consultancy to Viet Linh bamboo processing enterprise, Thanh Hoa province, to apply a zero-waste bamboo processing system in its factory. The system, transferred from Green Street JSC., to Viet Linh, has successfully changed the physio-chemical properties of Vietnamese bamboo and improved its quality. After treatment, the

bamboo materials both look better and boast a quality and durability equivalent to hard woods, like teak. Additionally, almost all by-products resulting from the treatment, such as fibre, shredded parts and other organic elements (lignin, etc.), are collected, which then are used as an energy source to feed biomass gasification equipment in the next treatment round (see Figure 1). This helps reduce the firm's energy cost, eliminates waste destined for landfill and improves health and safety at the workplace. The company was also advised to use environmentally friendly glues, which make bamboo products safer for humans, as well as decomposing after use.

Green Street JSC., also provides consultancy to suppliers of bamboo raw materials, who plant and harvest bamboo, on how to apply a closed-loop

cultivation model in their bamboo forest. In this model, bamboo suppliers replant bamboo plants and protect the biodiversity under bamboo shades (e.g. raising buffalo or goats and planting comfrey), and produce bio-fertilizer using bamboo by-products. By providing value-added services for stakeholders in the upstream of the bamboo product value chain, the service department of Green Street JSC ensures local sustainable and high quality bamboo sources while empowering enterprises along the bamboo value chain to enhance profits through cutting production cost from 10% to 20% and increasing both productivity and product quality. The trading department of Green Street JSC., then uses these sources to realise their creative, smart designs of bamboo flooring, furniture, décor and to export them to

Technology Transferring Service for Viet Linh Enterprise

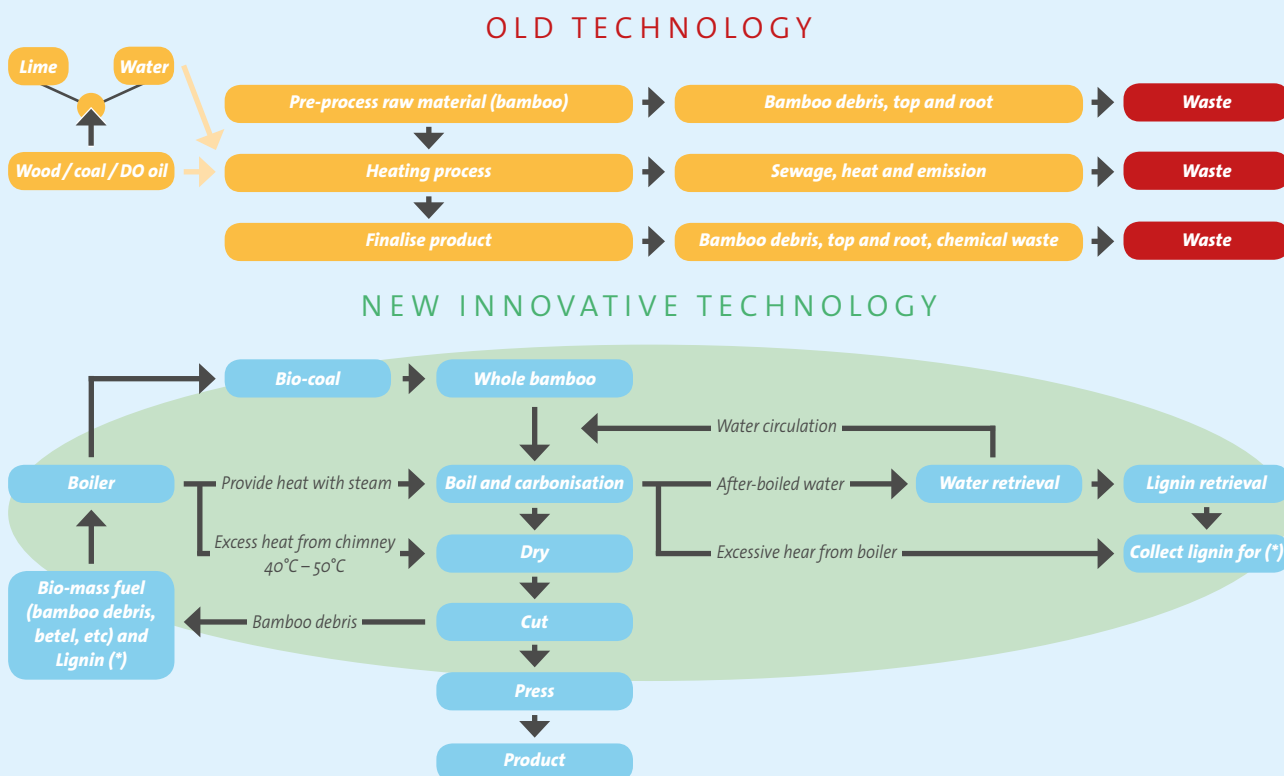


Figure 2: Comparison between the old technology of the Viet Linh enterprise and the innovative technology consulted and transferred by Green Street JSC
Source: Green Street JSC

Australia, New Zealand and the EU. The innovative resource-recovering business model of Green Street JSC., is expected to provide services for 470 bamboo-processing enterprises and bamboo forest owners of over 70 000 ha, gaining EUR 450 000 annual revenue by 2018 and doubling revenue every three years. The expected revenue for trading activities is EUR 3.1 million revenue per annum from 2018.

TAXI SÂN BAY GIÁ RẺ NHƯ XE BUÝT
TAXI ĐƯỜNG DÀI GIÁ RẺ NHƯ XE KHÁCH
 www.dichungtaxi.com

An airport taxi fare is as cheap as a bus ticket. A taxi fare for a long journey is as cheap as a shuttle bus ticket www.dichung.com

CASE STUDY 2

Sharing platform: The case of Dichung company

- <http://dichungtaxi.com>
- <http://dichung.vn>

Dichung is a social enterprise which provides customers with a convenient web-based platform to solve their transportation needs. It helps connect people who need a ride with others who want to share empty seats in their vehicles. The business goal is to create a ride-sharing culture in Vietnam, in which Dichung acts as a middleman, bringing users (passengers and drivers) together and overcoming barriers to sharing vehicles. It also works with transport companies to provide standardised ride-sharing services (taxi-sharing, van pools) via a B2B and B2C platform (dichungtaxi.com) which helps those companies collect extra customers and commodities to utilise their vehicles' empty slots.

Established in 2010, Dichung has already successfully engaged 20 business customers all over Vietnam to use the online platform (70% of which is airport taxi companies, the other 30% is truck taxi companies), providing an average of 500 shared rides from cities to airports and vice-versa every day, earning EUR 147 100 per year. There have also been 233 770 successful matches between vehicle owners and passengers.

Dichung has popularised their mobile application with more than 200 000 users (both share-riders and drivers) in Hanoi and Ho Chi Minh cities, with revenue of EUR 90 000 per year gained from advertising and registration fees.

To develop the customer database, Dichung.vn runs a marketing campaign aimed at target groups such as students, officers, travellers and tourists. The company also set up a team of volunteers providing free ride-sharing for people with disabilities. Unlike Grab taxi and Uber taxi, which subsidises drivers financially and incentivises them to use their apps and work like a taxi driver, without any corresponding tax burden or social contributions, Dichung.vn and Dichungtaxi.com focus on filling otherwise empty seats in private vehicles and taxis. This means that Dichung just helps drivers to save their fuel costs while reducing the transportation cost for ride-sharers based on their willingness to match, not solely for profit purposes.

Over the last six years, the innovative business model of Dichung has helped drivers (individuals, taxis and truck taxis) to save VND 6 315 200 000 (EUR 263 362) as well as 568 368 kg CO₂ for the environment, combined with lowered travel cost for passengers and reduced traffic jams. On the other hand, Dichung operates an innovative business model at a very low operational cost as they provide a sharing service without owning any motorbikes or cars.

Conclusions

Although the implementation of a circular economy in Vietnam is not yet obvious, there is still a vast potential to apply it, as proven by the given case studies. In order to take advantage of the circular economy concept and learn from the pioneering companies, other Vietnamese firms should consider the whole value chain to find opportunities for innovating their own business models. Capacity building, an increase in productivity and especially the promotion towards factory workers and stakeholders along the value chain (upstream to downstream) are also necessary for companies to apply a circular economy approach successfully in the longer term. Finally, a strong commitment to these long-term sustainable strategies is essential to ensure the development of circular economy business models and to convince investors to invest in new circular economy ideas.

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An example of construction and demolition waste recycling in New Delhi

By Sourabh Jain and Dr. Shaleen Singhal



Photo: Sourabh Jain

In developing countries, such as India, large quantities of raw materials (sand and aggregates) for construction are mined mechanically from river beds and floodplains; an activity that decreases the stability of land on river banks, causes bank erosion, and damages the ecology of rivers (Padmalal & Maya, 2014; Sreebha & Padmalal, 2011). In addition, most solid waste, including construction and demolition (C&D) waste, is dumped on open areas and/or – at best – reaches landfill, thus increasing pressure on already-

constrained landfill sites while wasting a resource. This could, however, represent an opportunity for India to embrace the circular economy approach, where waste is reused or recycled.

Currently, cities in India are growing rapidly and will continue to do so for the foreseeable future (McKinsey Global Institute, 2010; Seto, Güneralp, & Hutyra, 2012). Rapid expansion of the built environment increases demand for sand and construction aggregates. While there is an absence of reliable

data, the shortage of construction minerals, such as sand and aggregate, has been acknowledged (BMTPC, 2016; CSE, 2014; DA, 2015). The projected increase in demand for minerals is likely to worsen scarcity concerns. India generates around 12 million tonnes of C&D waste annually (BMTPC, 2016), which goes up to 530 million tonnes according to independent estimates (CSE, 2014). By 2041, India is likely to generate 2.7 billion tonnes of C&D waste (DA, 2015).

Current situation

A general depiction of C&D waste management in India is shown in Figure 1. A large quantity of C&D waste is currently landfilled and/or dumped in the open. Some C&D waste is either reused or recycled and turned into various products used in mobility infrastructure, i.e. low value applications such as road construction and footpath works. So far, there are only three C&D waste recycling units in India – two in New Delhi and one in Ahmedabad – compared to hundreds of units installed in many developed countries (BMTPC, 2016). Lack of appropriate management of C&D waste is causing environmental damage and wastage of huge quantities of valuable resources. For example, it is estimated that New Delhi alone generates around 5000 tonnes of C&D waste every day (TPD) (BMTPC, 2016).

However, as a recent initiative in New Delhi illustrates, recycling of C&D waste can contribute to closing the material loop in India's urban construction sector. Since 2009, the local authorities of New Delhi started collecting C&D waste separately and recycling it. The two C&D waste processing plants at Burari and Shastri Park in New Delhi have a total processing capacity of 2500 tonnes per day (TPD) of C&D waste (BMTPC, 2016). The plants recycle about 95% of incoming waste into useful products, such as aggregates of various sizes, bricks, pavement blocks, and kerbstones. In addition, there is a project-specific C&D waste recycling plant with a capacity of 150 TPD at East Kidwai Nagar in Delhi established by the National Building Construction Corporation to recycle C&D waste generated by the government's large redevelopment project (BMTPC, 2016).

Recycled products of C&D waste

Recycled products from C&D waste are found to be of acceptable quality and are up to 20-30% cheaper than conventional building materials (BMTPC, 2016; DA, 2015). So far, there is very limited use of recycled products for high-value applications, such as building works (e.g. the Supreme Court complex extension in New Delhi) (CSE, 2016). The reasons include standards that allow only naturally-occurring aggregates in concrete and a lack of standards for the products made from recycled C&D waste, such as bricks, blocks, and kerb stones. Other factors include a lack of awareness and a lack of acceptability of recycled products (BMTPC, 2016).

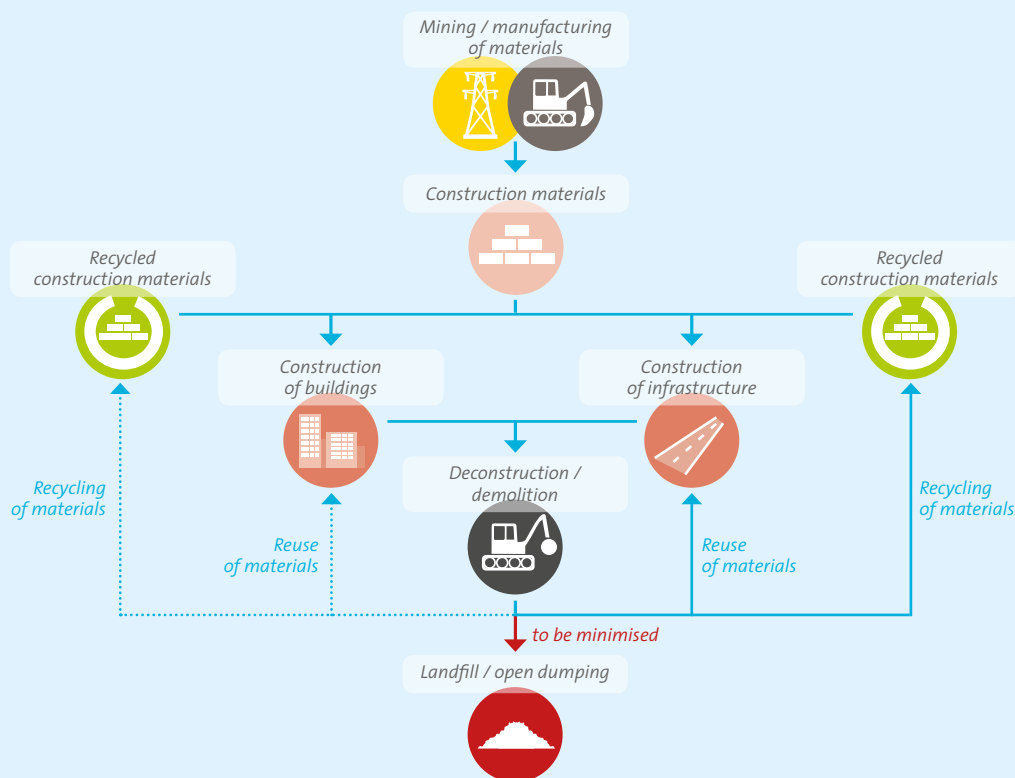


Figure 1: Circular flows of materials for construction sector in India
Adapted from BMTPC, 2016; DA, 2015; World Economic Forum, 2016

Drivers and challenges in C&D waste recycling efforts

Several actors are trying to overcome regulatory and market challenges in closing the material loop in the urban construction sector by promoting the use of recycled C&D waste for low as well as high value applications. In March 2016, the Ministry of Environment, Forest and Climate Change differentiated C&D waste from municipal solid waste and released separate rules for C&D waste management in urban areas. These rules promote the reuse and recycling of resources from waste and highlight the duties of various stakeholders. These rules mandate the use of recycled C&D waste products to a certain percentage in all municipal and government construction contracts, subject to quality control. In January 2016, the Bureau of Indian Standards (BIS) revised building material codes (IS 383:2016) to promote the use of recycled aggregates as construction materials. The revised code now allows the use of recycled products up to 100% in non-structural applications and up to 20% in structural applications. Before the revision, BIS building codes only

allowed the use of naturally-occurring aggregates in concrete. The remaining market challenge is a lack of demand and awareness.

The Government of Delhi advised all its agencies to incorporate a clause in their tenders mandating a minimum of 2% use of recycled products in building works and a minimum of 10% use of recycled products for road construction works to create a market for recycled products (IL&FS, 2015). In addition, the government also encouraged its agencies to install on-site C&D waste recycling units on those redevelopment projects costing more than 500 crores Indian rupees (EUR 68 million). The Kidwai Nagar redevelopment project is an example of how government mandates can encourage on-site recycling of C&D waste (DSIIDC, 2015).

Currently, out of hundreds of cities, only two cities in India have made certain progress towards C&D waste management. The next important steps would be for local and state governments to implement C&D waste management guidelines. Overall, installation of recycling plants, revision in concrete standards to allow the use of recycled C&D aggregate, bringing mandates to

use recycled C&D waste materials in government contracts, and the release of C&D waste guidelines are encouraging steps for bringing about long-term changes. These recent initiatives are encouraging signs for integrating principles of the circular economy in the urban construction sector of every Indian city.

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Display of different products made from recycled C&D waste

Photo: Sakshi Srivastava



Photo: Sourabh Jain



Shastri Park C&D waste recycling plant in operation

Photo: Sakshi Srivastava

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Increasing resource efficiency in the metal product supply chain in South Asia's building sector

By M. Balakrishnan, R. Batra, F. Eisinger, A. H. M. Rezaul Kabir, S. Kumarasena, A. B. Manandhar, S. Melnitzky

Small and medium-sized enterprises (SMEs) can make a significant contribution to improving the environmental and resource friendliness of production processes in Asia. Against this background, a team of local and international project partners has begun advising 400 enterprises from the metalworking and building sectors in Bangladesh, Nepal and Sri Lanka through the *METABUILD* project (2016–2020). The project's target industries cover:

- steel rerolling mills;
- ferrous and non-ferrous foundries; and
- blacksmith and light engineering products that are linked to the construction sector, such as bathroom fittings, electrical cables, roofing materials, gates, doors, grills, frames, etc.

The project is funded by the EU SWITCH-Asia Programme and succeeds the SWITCH-Asia project *ACIDLOOP* (2012–2016, <http://www.acidloop.in>) that was set in India's metal finishing industry. The *METABUILD* project replicates the capacity-building approach and active engagement with the target

SMEs for resource efficient and cleaner production (RECP) implementation that had been developed for the *ACIDLOOP* project and up-scales it to Bangladesh, Nepal and Sri Lanka.

The project's kick-off meeting took place in April 2016 in Dhaka (Bangladesh) and led to the joint preparation of an action plan for implementation. Soon afterwards, training-of-trainers (ToT) courses on the *METABUILD* approach to resource efficient and cleaner production (RECP) were conducted in all three target countries. The ToTs addressed local consultants from the Dhaka Chamber of Commerce and Industry (DCCI), from the Society for Environmental and Economic Development (SEED) Nepal, as well as from Sri Lanka's National Cleaner Production Centres (NCPC). The recruiting of these consultants was based on defined selection criteria, such as technical educational background, prior experience in working with SMEs and prior RECP experience, in order to ensure sufficient technical competence for the subsequent project implementation. Most of the consultants trained during this first round of ToTs have already started to work

with the project's 'pioneer companies' on implementing RECP measures. These pioneer companies include six companies from Bangladesh, ten from Nepal and ten from Sri Lanka that had signed in early for the *METABUILD* project and were ready to implement RECP measures in the first year of the project. Additional pioneer companies from Bangladesh are being identified. Successful implementation results from the pioneer companies will be used to attract other companies from the target regions to join the project from the second year onwards.

The project technical teams have carried out initial assessments of the manufacturing processes from a RECP perspective at more than 25 pioneering companies. These assessments consisted of one or two day visits by technical teams from the local partners supported by Indian experts, wherein relevant process measurements such as power logging, thermography studies, flue (exhaust) gas analysis, water flow and water quality measurements were conducted. In all the companies assessed, the technical team found several options for improving resource efficiency through



Understanding the current situation through measurement is an important step to determine the most effective RECP improvement required at SMEs. Here a RECP consultant is analysing the exhaust gases of a zinc melting furnace with the help of furnace operator at a pipe manufacturing company in Bangladesh.

simple measures such as starting monitoring resources used, improving insulation of furnaces, reducing water spillage and flow rates, reducing leaks in compressed air lines, avoiding under-loading and idle running of motors, etc. Initial Assessment Reports have already been handed over to 20 of these companies and detailed discussions held with the company management to identify those RECP options that the company would like to implement within the next two to three months. Within the next few weeks, the remaining companies will also receive their assessment reports and subsequent support. Detailed action plans are being developed, and additional technical support such as selection of optimum insulation material, guidelines, templates and practical tips for light-level study, setting up simple data collection methods for monitoring is being provided by the local technical teams. Progress on completion of initial assessments, preparation of the reports, developing detailed action plan and all such related steps for the successful RECP implementation at the client companies is being tracked through an online 'status board' that is accessible to all partners in each of the countries.

Already some companies have started to benefit from their participation in

the *METABUILD* project. One company in Sri Lanka has started collecting their consumption data through log sheets at the shop floor; another company in Sri Lanka now operates cooling tower fans only when water temperature exceeds a set value; a company in Nepal improved the insulation on a heated tank and has started to save energy through reduced heat loss.

Such implemented actions are expected to increase rapidly as the *METABUILD* technical teams continue to visit, motivate, capacitate and support the staff at the pioneer companies.

The second ToT will take place in India in December this year. During this two-week in-depth training course, 25 consultants from all three project countries will be trained, building upon the practical RECP exposure they obtained at the pioneering companies.

In the coming years, the *METABUILD* project will also provide training on financing options for the deployment of more resource-efficient technologies in SMEs. On the one hand, this training will support the companies' management staff in accessing funding and increasing their financial literacy. On the other hand, the project addresses local bank branches to build their capacity on RECP financing. In addition to these capacity-building measures, the project team will organise regional dialogues among the three countries to create awareness for RECP in the SMEs' political and business environments. While the policy dialogues will serve to promote a discussion between representatives from politics and industry on how policy measures can further strengthen resource efficiency in industry, the client dialogues will serve as platforms for exchange between SMEs and their customers on the impacts of resource efficiency.

Through these activities, the *METABUILD* project aims at implementing sustainable production processes and practices in 400 SMEs in Bangladesh, Nepal and Sri Lanka and at creating a

conducive environment for further adoption of sustainable production processes in the metal products supply chain for the building and construction sector.

The *METABUILD* partners are TERI and STENUM Asia from India, Austria Recycling (AREC) from Austria, adelphi from Germany, SEED from Nepal, DCCI from Bangladesh, and the National Cleaner Production Centre from Sri Lanka.



Companies that process metals (ferrous or non-ferrous) and are supplying their products to the building and construction sector, from Bangladesh, Nepal or Sri Lanka that wish to join the *METABUILD* project are invited to contact the local partners through the project website: <https://metabuild-southasia.org>

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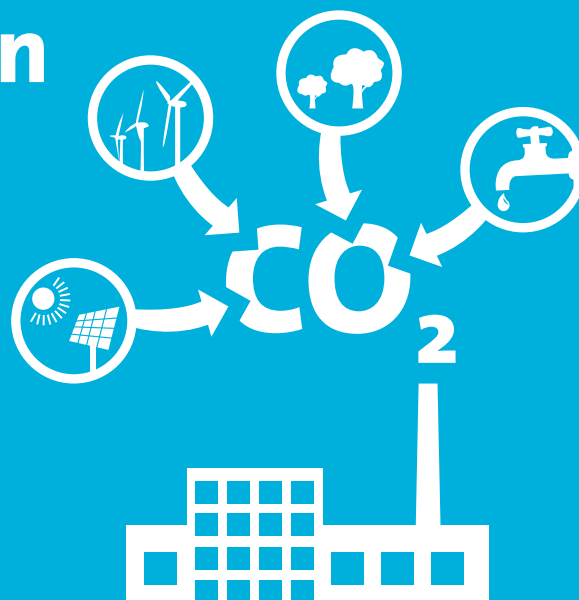
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The role of SCP in climate change mitigation and adaptation

By Kartika Anggraeni



In conjunction with the 5th Asia-Pacific Climate Change Adaptation Forum and “Sri Lanka NEXT – A Blue Green Era” Conference and Exhibition that were held in Colombo, Sri Lanka, on 17-19 October 2016, the SWITCH-Asia Policy Support Component in Sri Lanka and the SWITCH-Asia Network Facility organised a conference on the role of sustainable consumption and production (SCP) in climate change mitigation and adaptation. The networking event, endorsed by Sri Lanka’s Ministry of Mahaweli Development and Environment, brought the SWITCH-Asia projects’ experiences and case studies into the regional climate change debate and was attended by some 200 national and international climate change experts and policymakers.

Two technical sessions showcased the SWITCH-Asia projects’ strategies to address climate change mitigation and adaptation in their local contexts. Having small and medium-sized enterprises in focus, the SWITCH-Asia Programme seeks to promote a proliferation of

green industry in Asia, specifically in the 18 developing countries where it operates to date. Various measures to reduce environmental impacts of industries have been implemented by the SWITCH-Asia projects, ranging from clean and resource-efficient technologies, waste management, certification and standardisation to public-private partnerships and sustainable public procurement. In so doing, the projects seek to avoid and reduce the adverse effects of Asian industries on the surrounding environment, communities and society at large.

Mitigating and adapting to climate change

In the first session, four SWITCH-Asia projects presented their approaches to mitigate climate change within several industrial sectors in Sri Lanka, the ASEAN region, Pakistan and India.

The “Sri Lanka Renewable Energy” project promotes the use of biogas systems as a way to address the issue of

solid waste – an issue which is plaguing many Asian developing countries. The project plans to roll out a large-scale dissemination of biogas systems for SMEs in both the tourism industry and households. To achieve it, the project targets the demand side and the supply side simultaneously by mobilising the manufacturing and construction private sector, micro finance institutions (MFIs), the tourism industry and society as a whole. So far, 475 new biogas units have been installed by 40 micro, small and medium-sized enterprises (MSMEs) trained by the project, thus creating new business opportunities.

The “ASEAN SHINE” project is active in eight southeast Asian countries, establishing common minimum energy performance standards (MEPS), changing consumer purchasing attitudes in favour of energy efficient air conditioners and therefore increasing its market share and the region’s overall energy security. The project succeeds in harmonising the ASEAN standards for the testing methods with ISO5151:2010

and in having the ASEAN Ministers of Energy Meeting endorse the “ASEAN Regional Policy Roadmap for Harmonisation of Energy Performance Standards for Air Conditioners” in October 2015.

The “HP Cogen Pakistan” (High Pressure Cogeneration, HPC, for the sugar sector) promotes the use of sugar bagasse as a source of renewable energy, which, at the same time, addresses a waste issue of the sugar industry in Pakistan. The project works with 70 sugar mills for the uptake of HPC technology.

The “ACIDLOOP” project in India promoted a closed loop industrial process for acid recovery, as well as resource efficiency (materials, energy consumptions), with Indian metal finishing MSMEs. Completed in early 2016, the project showed how it had successfully reached out to 664 MSMEs, with 385 MSMEs trained and 106 MSMEs selected for direct coaching on resource efficiency measures, in particular electricity consumption. In the end, the project reported a 25% reduction of GHG emissions or 2289 tonnes CO₂ by the MSMEs.

During the second round of discussions, two SWITCH-Asia projects presented their strategies and achievements related to climate change adaptation.

The “Greening Sri Lankan Hotels” project (2009-2013) was implemented in nine provinces to improve the environmental performance of small and medium-sized hotels, through improvements in energy, water and wastewater management systems. The project involved 179 hotels directly, by providing them with advisory support, as well as technical assistance to other hotels towards implementing sustainable consumption practices, such as the selection of energy-efficient equipment and wastewater treatment plants, installation of biogas plants, waste recycling opportunities, forming resource management teams and staff training on best practice. The improvements in water and energy consumption by the participating hotels subsequently



SWITCH-Asia event in Colombo, Sri Lanka
Photos: SWITCH-Asia Network Facility

became a benchmark for the Sri Lankan hotel industry. The “MSME Clusters” project (2012-2016) addressed sustainability issues (including productivity levels, energy efficiency, natural resource usage and occupational health & safety practices) in India’s foundry sector, through the introduction of technological changes such as divided blast cupola so to increase energy efficiency. It successfully improved the energy efficiency status of 480 enterprises by reducing their coal consumption of 16,600 metric tonnes and increased workplace safety in 375 enterprises impacting some 5,000 workers.

The importance of facilitating a national SCP policy roadmap

With a mandate to support the Sri Lankan government in formulating its SCP policies, the SWITCH-Asia Policy Support Component in Sri Lanka (2015-2019) established the national SCP baseline status and monitoring indicators for sustainable production and sustainable consumption in selected sectors as well as at the national level, where the government’s validation is to be expected. It has reached the first milestone of setting up a standard for the policy formulation process (policy format, protocol and assessment) and drafted an SCP policy for Sri Lanka’s 12 thrust sectors ranging from food, energy to

tourism and waste – whose attainment will contribute to Sri Lanka’s Sustainable Development Goals – which is in the process of being validated by the government. Despite common challenges such as the lengthy process to adopt policy recommendations by the government, the Policy Support Component is contributing to the creation of an enabling policy environment for SCP adoption in Sri Lanka.

In summary, the SWITCH-Asia projects and Policy Support Component showed how they furthered climate change mitigation and adaptation through their on-the-ground project implementation. With their ‘test and prove’ approach, it is relatively clear where further interventions are still needed (policy support, access to finance) and which SCP measures (resource efficiency, cleaner production, waste management) can be scaled up regionally within Asia.

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Best wishes for a happy holiday season!
We appreciate your support throughout the year and
look forward to our continued cooperation in 2017!

The SWITCH-Asia Network Facility



HAPPY NEW YEAR!

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