Towards a Circular Economy in Asia

ISSUES AND OPPORTUNITIES

FUNG GLOBAL INSTITUTE

ELLEN MACARTHUR FOUNDATION
Rethink the future

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INTRODUCTION: THE ISSUES FROM ASIA AND CHINA

Sustainable development is high on Asia's agenda, but how this change will come about remains highly contested, especially since it is competing with other pressing issues – from rebalancing and financial stability, to social unrest and security threats. A paradigm shift is necessary to raise the quality of economic growth, while offering rich rewards across societies for businesses and citizens, moving away from the depletive cycle induced by the current "take, make, dispose" model.

The challenge of transitioning to more sustainable growth models is complicated by widespread debate over its nature, from both economic and business perspectives. Questions remain regarding how to foster such growth and help new models reach scale. Due to its systemic nature, the shift involves all members of society – businesses, banks and financial services, policymakers and regulators, as well as consumers – but the sequencing of change is contested. Businesses say that they are waiting for better regulation, more funding and for consumers to be willing to pay. Consumers say that businesses need to act and radically change their products and business models. Regulators say that some sectors, including consumers, are resisting change.

In such circumstances, how do we turn a vicious cycle into a virtuous one? Who should take the lead – policymakers, businesses or consumers?

Undoubtedly, policy can play a decisive and leading role. Three decades of strong and fast growth in China were ignited by Deng Xiaoping's opening-up policy in 1979, one of the world's great examples of policy-driven change. Of course, business creativity and entrepreneurship, as well as favorable

Top-down governance can play a decisive role towards greater sustainability, but business-driven change may be more conducive to uncovering innovative solutions.

demographics, played critical supporting roles; but at its heart, this was a decisive policy measure meant to change the nature of the economy.

Today China is attempting to enact another policy-driven economic transformation by rebalancing its growth to ride higher on the value chain and be more socially redistributive and environmentally sustainable. While the jury is out on the larger questions of transformation, measures such as environmental taxes, carbon emissions trading zones, administrative guidance on pollution and financial incentives are already having an impact on business and industry in the locales where these are being instituted.

While China offers a window into how top-down policy can produce change, not all governments or economies are able to adopt similar approaches, nor is the top-down approach always the best way to bring innovation and business creativity to the fore. Arguably, the best example of a non-policy based game-changing driver in recent years is the Internet, which transformed business, trade, communications and consumer habits from the ground up. The fact that the changes took place in a very uncoordinated and spontaneous manner made possible a very high level of innovation that would have been unimaginable under a top-down framework.

Businesses that are interested in the long-term and believe in collective responsibility are thus confronted with the task of making real their contributions to positive development

within the context of their operational, financial and business needs. It is all about a better way to do business, continuing to produce valuable goods and services profitably, while helping to safeguard and rebuild social as well as natural capital.

The business models that will carry this out are being explored today, and it is in this spirit that the Ellen MacArthur Foundation and Fung Global Institute have partnered to put forth the circular economy as one such model that could hold much potential for Asia. A workshop was held in Hong Kong in April 2014, bringing together over 40 participants including business leaders, investors and researchers to explore issues related to Asia's adoption of business and growth models that support sustainable development.

The Ellen MacArthur Foundation and Fung Global Institute have partnered to explore the concept of a circular economy as a largely business-driven opportunity towards greater sustainability in Asia.

This report summarizes the outcomes of the workshop and introduces the concept of a regenerative circular economy, which expands on the established practices, such as recycling and remanufacturing, to address key issues around resource efficiency, waste and value recovery within supply chains. It is an idea that is both attractive from a purely commercial perspective, as well as for sustainability.

We hope that this serves as a starting point for further discussion and experimentation on the role of business in sustainable growth and prosperity. We also acknowledge that solutions for sustainable growth will not be found in a single model, no matter how compelling the model may be.

A wide variety of organizations, businesses and thought leaders have suggested a range of other models for sustainable business, which also deserve our full consideration. For example, FGI has looked at Sustainable Lifestyles, in which products are conceived and designed to help consumers make more sustainable choices in their daily lives. Other businesses are trying to structure themselves around the concept of Creating Shared Value in which businesses create economic value in a way that also generates value for society. Still others build strategy based on principles such as ethical sourcing, social impact investing and human-centered development.

Models and frameworks will need to be tested and refined in the process. This report is a step in that direction with regards to the circular economy.

For much of the world, creating pathways towards regenerative development, which decouples growth from the consumption of finite resources and helps rebuild capital, represents new terrain. Ideas and models will need testing, iteration and refinement, even as they are scaled to address urgent issues across the economy, society and environment. We hope this report will be a step in that direction.

"The discussions in today's workshop illustrate the business case for a circular economy, and the importance of bottom-up, business-driven change. We're at the right moment, with the right idea, and in the right place."

WILLIAM H. OVERHOLT
Fung Global Institute

OVERVIEW OF THE CIRCULAR ECONOMY

The vast majority of today's economic activity can be characterized as linear: materials are extracted and turned into products, which are used and consumed, and then mostly disposed, either in landfills or through incineration. This model optimizes functionality and cost with little or no consideration for products' recovery value after their first use. It results in large amounts of waste and loss of productive resources and value.

In a linear economy, trillions of dollars worth of materials are lost to landfill or incineration. The system is geared towards disposal, rather than recovery.

In recent years much focus has been placed on increasing recycling rates, and while this has had some positive effect, it is ultimately an inefficient approach because the linear system was never designed with recovery in mind – and in many cases is in fact optimized for disposal.

For fast-moving consumer goods (FMCG), the total annual material input value is estimated at US$3.2 trillion globally, 80 per cent of which is lost to landfill or incineration.[1] For electric and electronic equipment, around 72 million tons of waste are produced annually, which represents a substantial value. For example, 1 ton of mobile and smart phones contains around US$28,000 of gold, silver, copper and palladium. This is driving the emergence of new business models for phone recovery and new industries, such as urban mining.[2]

Rising commodity prices, volatility, and demographic pressures expose the limits of a linear economy.

Additionally, in the linear model, new products are almost entirely dependent on the use of virgin materials – significantly exposing future profitability to increases in materials prices and price volatility. While over the 20th century we have

1. Ellen MacArthur Foundation. 2013. Towards the Circular Economy 2: Opportunities for the Consumer Goods Sector.
2. The Ellen MacArthur Foundation Circular Economy team.

"A ton of mobile phone waste – which is about 6,000 mobile phones – represents US$28,000 worth of gold, silver, palladium and copper. There is an increasing realization that this massive amount of waste is valuable and that there are opportunities for recovering them."

ANDREW MORLET
Ellen MacArthur Foundation

observed a steady decline of average commodity prices, driven by improvements in resource productivity and discoveries of new reserves, since 2000 this trend has been replaced by price rises or greater volatility.[3]

There are good reasons to believe that these trends are going to last. The world population is increasing rapidly. More importantly, large regions of the world are developing economically at an unprecedented speed. It is expected that by 2025, the global economy will count three billion more middle-class consumers, of which nearly 90 per cent will emerge in the Asia-Pacific region.[4] For all of these reasons, the linear economy is now approaching its limits.

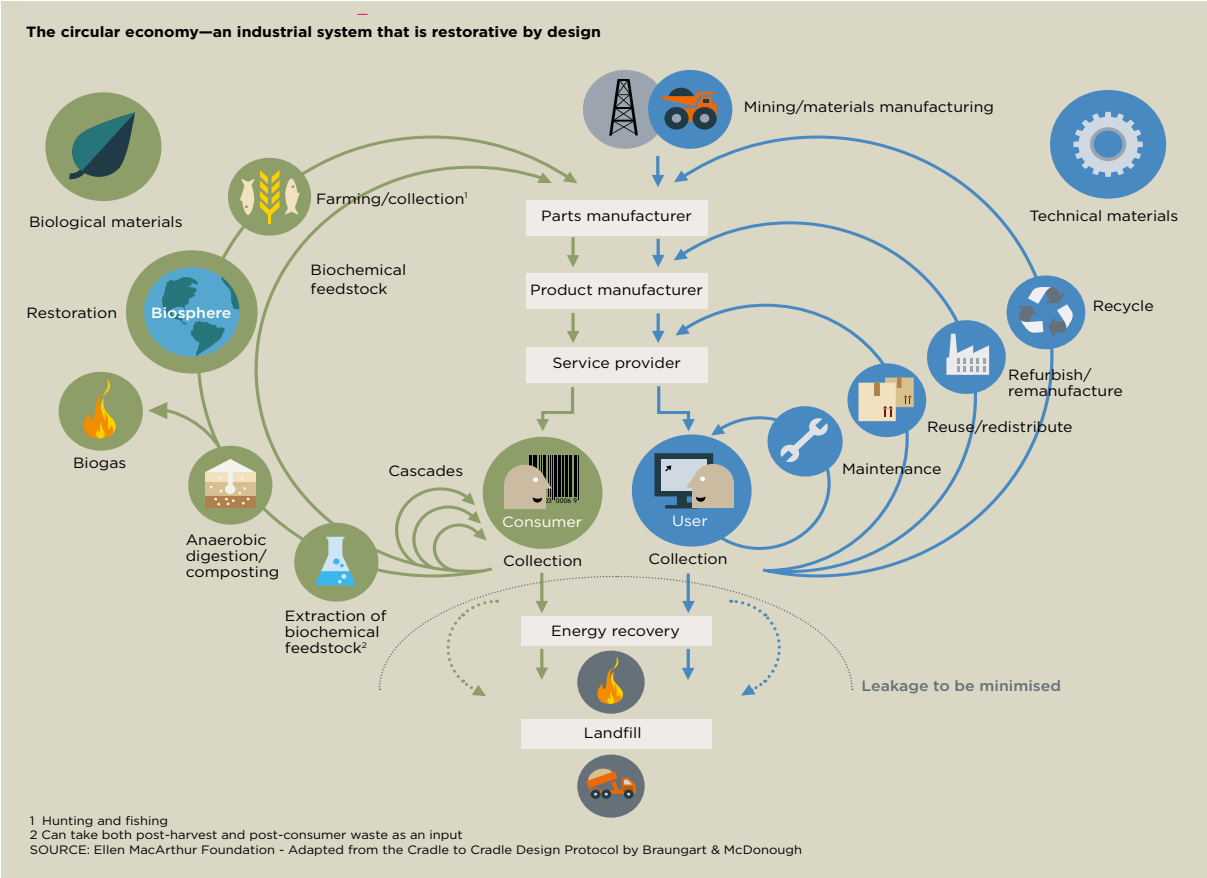
A circular economy aims at eliminating waste and optimizes the repeated recovery and reuse of biological and technical materials, such as plastics and metals.

A circular economy, by contrast, is an industrial system that is regenerative by intent. It replaces the "end-of-life" concept with restoration, shifts towards the use of renewable energy and eliminates the use of toxic chemicals, which impair materials recovery and reuse. The aim is the elimination of waste through the superior design of materials, products, systems and, within this, business models.

3. Dobbs, Richard, Jeremy Oppenheim, Fraser Thompson, Sigurd Mareels, Scott Nyquist, and Sunil Sanghvi. 2013. Resource Revolution: Tracking Global Commodity Markets: Trends Survey 2013. McKinsey Global Institute.
4. Kharas, Homi. 2010. The Emerging Middle Class in Developing Countries. OECD Development Centre Working Paper No. 285.

In a circular economy, we differentiate between two types of materials: biological ones, which can return safely into the biosphere while restoring natural capital, and technical ones, such as plastics and metals, which should circulate in the system for as long as possible (see Figure 1).

Figure 1: The circular economy - an industrial system that is restorative by design



Consumable products will cascade and metabolize through biological cycles. For example, clothing can be collected and reused, then cascaded as furniture stuffing, and then as insulation fiber and ultimately biodegraded (provided, of course, the fabric does not contain toxic additives, which goes back to the design issue). Food production by-products and food waste can be cascaded in animal feedstock, used for chemical extraction, or used to produce energy and fertilizer via anaerobic digestion. A key enabler to these approaches is the elimination of toxic chemicals and clear separation from technical materials.

Durable products are designed to cycle in the technical sphere through disassembly and reuse. The outer-most loop of the technical cycle is where recycling occurs. However, the majority of the value exists in the inner loops and this is where the emphasis needs to be placed. These tight product and component cycles set the circular economy apart from linear disposal and recycling models, where large amounts of embedded energy and labor are lost.

In a circular economy, the relationship between seller and buyer may need to become one of leaser and user, in order to facilitate product take-back and materials recovery.

For these technical material cycles, the circular economy largely replaces the concept of a consumer with that of a user, calling for a new contract between businesses and their customers based more on services and product performance rather than on the transfer of materials ownership. Unlike in today's "buy-and-consume" economy, durable products are leased, rented or shared wherever possible. When they are sold, there are incentives or agreements in place to encourage return and thereafter the reuse of the product or its components and materials at the end of its period of primary use.

A circular economy would require less energy. For example, remanufacturing an engine requires 75 per cent less energy than making a new one from virgin materials. The intention is to enable the circular economy to run more on renewable resources, adding to the system's resilience (e.g. to oil shocks).

The model also helps decouple growth from material constraints. Material demands are indeed substantially lowered as a result of products cycling through the inner loops before being recycled at the end of productive use, and as a result of cascading and metabolizing organic materials such as food waste, animal manure and human waste.

"Hopefully in the not too distant future, many discarded materials that are now going for energy recovery will instead be segregated for recovery as a material resource. We are at the beginning of this process and we need to walk before we can run."

JOE ZORN
Veolia, Hong Kong

In the first of a series of reports by the Ellen MacArthur Foundation with McKinsey & Company, it was estimated that, in medium-lived complex product sectors, which cover products such as mobile phones, washing machines and cars, the circular economy would represent a net materials cost savings opportunity of US$520 to 630 billion per year in the EU alone.

A circular economy presents significant savings opportunities to businesses and economies. Co-benefits include higher product quality and environmental resilience.

The second report focused on FMCGs, this time at the global level. In this case, the analysis uncovered an additional US$700 billion cost saving opportunity per year at the global level. This corresponds to a

recurrent 1.1 per cent of 2010 GDP, all net of materials used in the reverse-cycle processes. Those materials savings would represent about 20 per cent of the materials input costs incurred by the consumer goods industry.

This is only part of the benefits of a circular economy. Companies could also increase their revenue through new client relationships and new types of business models, such as those discussed below, and they would be more resilient to external shocks. Consumers reap benefits as well. Circular economy performance-based models could make high-quality products much more affordable. Finally, a circular economy could help create resilient and prosperous economies in a healthy environment with restored natural capital. In the following we explore a few sector examples to illustrate some of the principles of a circular economy.

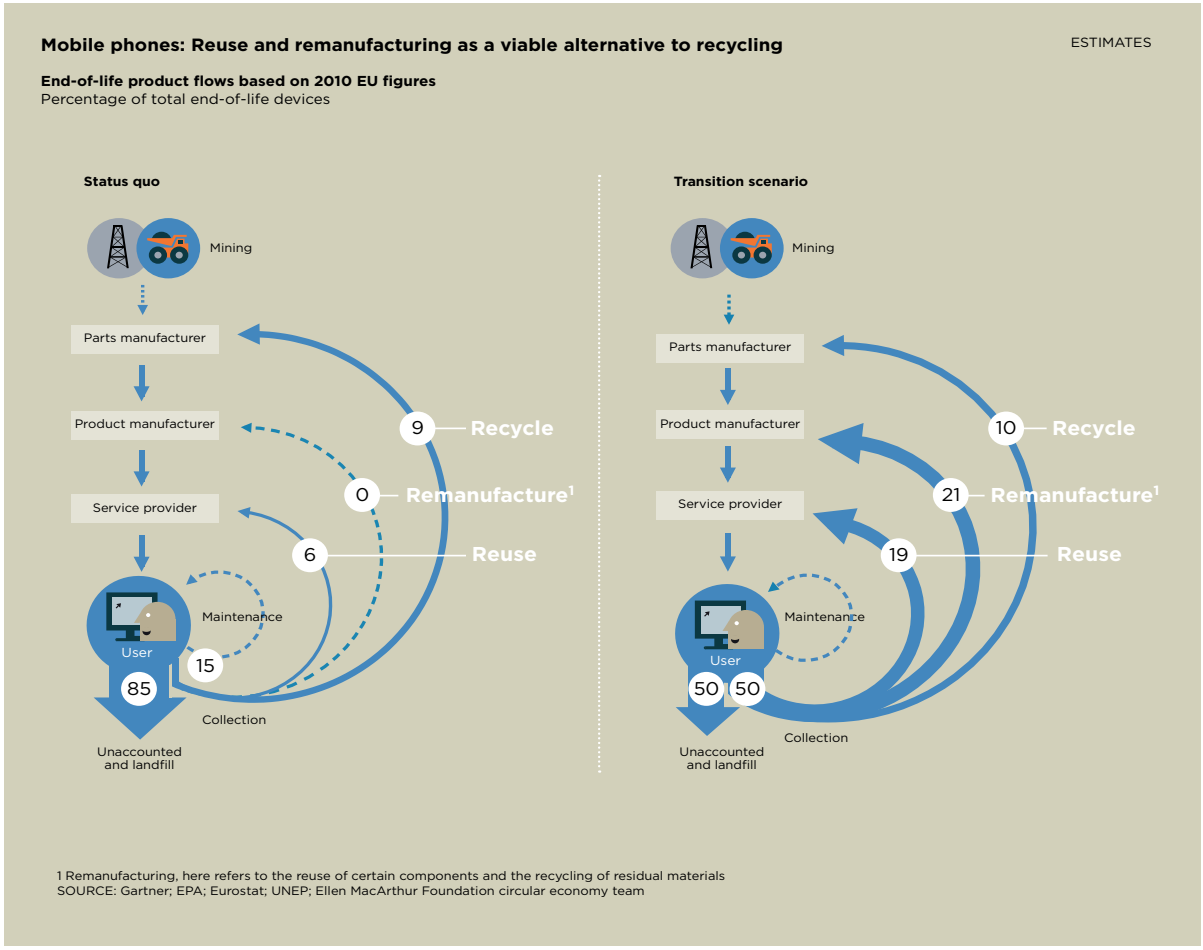
Mobile Phones

Let us start with the example of mobile phones. The first "Towards the Circular Economy" report considers two future scenarios: a transition one and an advanced one (see Figure 2). In both cases, collection is assumed to increase at end of life, and inner-circle treatments are favored over recycling. For example, today, only 15 per cent of mobile phones are collected, most of which are being recycled and the rest are being reused in different markets.

Embedded value in post-consumer products can be recaptured through maintenance, reuse, remanufacturing, and recycling. Improvements in design can increase the profitability of each.

In the transition scenario, collection would increase to 50 per cent without recycling much more, but with increases in remanufacturing and reuse.

Figure 2: Mobile phones - Status quo and transition scenarios

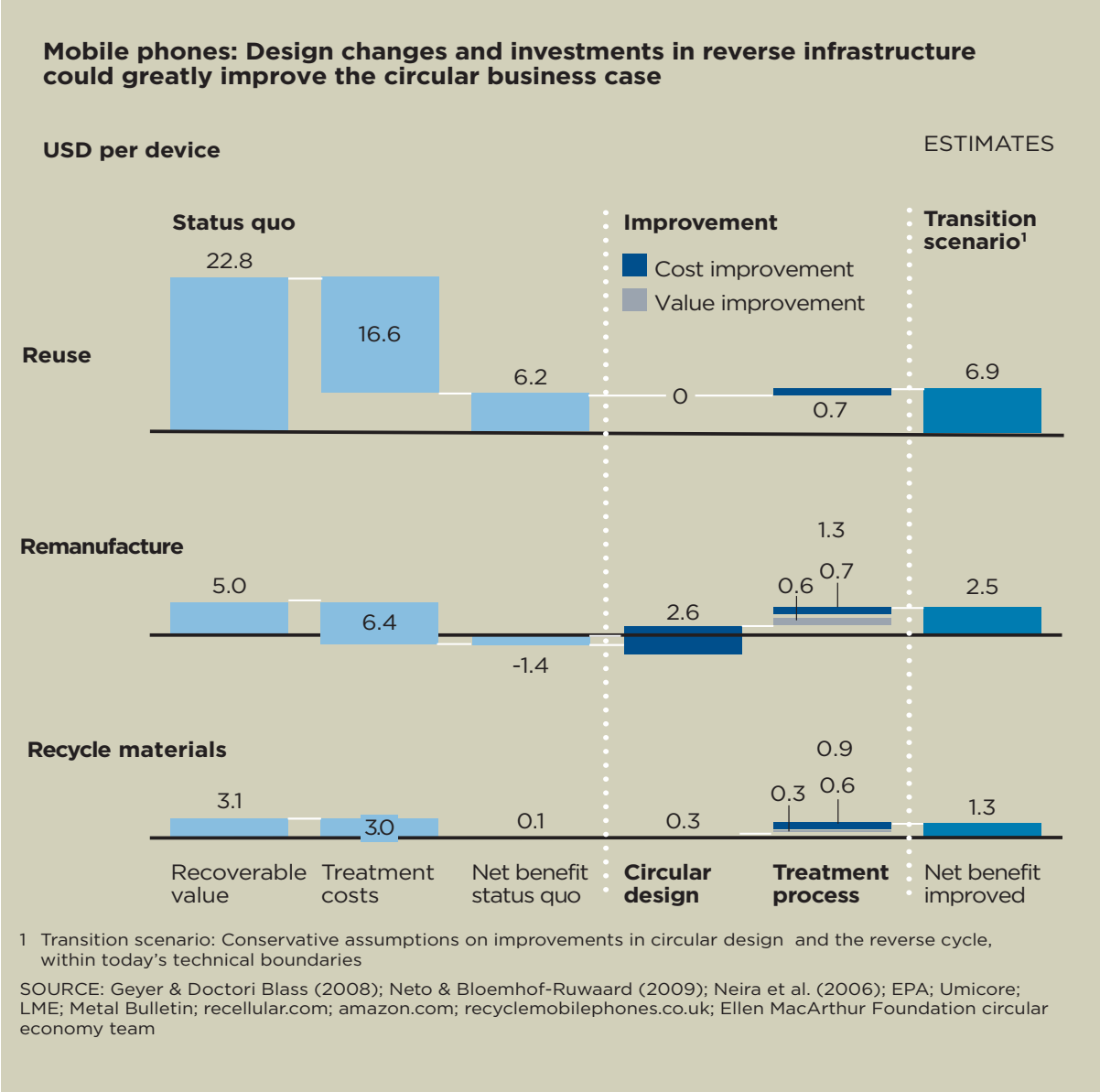


The report analyzes the profitability of these different options (see Figure 3). In the current industrial system, reuse is the most interesting approach – about US$6 can be captured out of an average mobile phone after deducting costs. Recycling appears to have a small positive value, but remanufacturing actually costs more than the value that is recovered from it. This explains well today's situation.

In a circular economy, mobile phone design would be improved, for example to enable disassembly or longer-lasting components. Treatment methods also have room for improvement, leading both to higher value outputs and lower costs. After taking into account small tweaks in design and treatment, reuse and recycling of mobile phones become more valuable and remanufacturing turns into a profitable activity, with a US$2.5 net benefit per phone.

This illustrates the power of the inner loops: the approaches that rely on preserving, as much as possible, the integrity of products – including their embedded materials, energy and complexity – are more valuable.

Figure 3: Mobile phones - Design changes and investments in reverse infrastructure could greatly improve the circular business case



1 Transition scenario: Conservative assumptions on improvements in circular design and the reverse cycle, within today's technical boundaries

SOURCE: Geyer & Doctori Blass (2008); Neto & Bloemhof-Ruwaard (2009); Neira et al. (2006); EPA; Umicore; LME; Metal Bulletin; recellular.com; amazon.com; recyclemobilephones.co.uk; Ellen MacArthur Foundation circular economy team

Construction Sector

Innovations in building design, such as increased modularity, can improve the recoverability of construction and demolition waste.

Significant opportunities exist in the construction sector as well. For instance, construction and demolition give rise to major waste streams, most of which are currently not captured despite the potential value involved. Instead of demolishing a building, for example, firms can deconstruct the building to harvest materials that would otherwise be considered as "waste," reusing these in new construction projects or other industries. This not only reduces the waste going to landfills, but it also decreases the cost of new construction, especially since many building

materials may hold their value even at the end of the building lifecycle. Rethinking traditional construction flows will help bring deconstruction to scale. New business models would also help treat the built environment as a material asset bank – for example, by leasing and tracking metals and components and integrating re-purposing strategies in the initial design. Finally, opportunities in the built environment concern more than material resources. New types of buildings incorporate the production of renewable energy, for instance by using solar cells. In the rapidly urbanizing regions of China and Asia, leveraging these many opportunities could deliver substantial benefits.

"Remaining the owners of our products via a performance-based business model is a large opportunity for Philips. However, our worst nightmare is that we would have warehouses full of returned products and that we would have no market developed for these products. Therefore, in a circular economy, products need to be designed for refurbishment, reparability and upgradeability so that there is value in reusing these products again and again."

BART GOETZEE
Royal Philips

Washing Machines

Washing machines provide a great example of the value that can be captured in performance-based models, where consumers pay for the service provided by products, rather than the product itself. Despite higher upfront costs, high-end machines today cost only half as much per wash for the user than low-end ones, simply because they are more durable. At the same time, these are about 35 per cent more profitable for the original equipment manufacturers (OEMs) and are less material intensive. A model in which users pay per wash rather than upfront would help overcome the barrier of upfront costs for

consumers, while giving businesses a longer-term income stream. However, marketing would need to address a number of concerns consumers from various parts of the world might have when it comes to leasing models. A transparency and practicality effort also has to be made with regards to the contracts themselves, which should be as simple to deal with as an outright sale in order to gain consumers' approval.

Remanufacturing

Remanufacturing is the process of disassembly and recovery of a product, returning it to its original state without loss of quality and often with the same warranty. It can be a very valuable approach. Renault's remanufacturing plant is their most profitable one, and it avoids the use of a significant share of energy, water and material resources. The process is, however, currently only marginally used, but may become more compelling in an environment of rising costs and or scarcity of inputs. Possible barriers include misaligned legislation, suboptimal design and consumer perceptions. Overcoming these challenges could deliver significant benefits in Asia. For example, China is now considered the world's premier manufacturing hub. Could the associated infrastructure and capabilities be leveraged to also make the country the world's premier remanufacturing hub?

Remanufactured products and components can be sold back to customers without loss of quality and with the same warranty. But capabilities need to be developed.

"The key to transforming supply chains to boost circular economies is to get global buyers to focus on product design and to work with factories to extract more value from the production process. Design is critical, and so is education."

MICHAEL LIANG
ESD China
Member of Inogen Alliance

UNPACKING THE ISSUES: THE CIRCULAR ECONOMY FROM FOUR PERSPECTIVES

This section draws upon discussions held during an April 2014 workshop in Hong Kong on the circular economy and the challenges and opportunities of applying circular economy thinking to different issues in Asia. The key insights and takeaways presented below are not meant to be exhaustive or comprehensive, but rather aim to serve as starting points for further enquiry.

"We [BASF] map product value chains against sustainability criteria to pinpoint the "hot spots" where better chemistry can create more efficiency or sustainability. Transparency is key. Also important are incentives to drive smarter business decisions."

RACHEL FLEISHMAN

Global Supply Chains

1. Globalization, specialization and improvements in technology – backed by a singular wish to bring more products to consumers at a faster pace and a lower price – have resulted in increasingly fragmented and complex global supply chains. Today, even a "simple" consumer product may be the work of multiple companies in many parts of the world and may have crossed numerous borders before reaching its final destination. These trends have expanded global trade and facilitated the integration of thousands of small and medium sized producers into the global economy. However, by under-pricing waste and environmental damage, they also form the backbone of today's linear economy.

2. Global supply chains pose particular challenges and opportunities for the advent of the

circular economy. The fragmentation of supply chains may inhibit the connectivity, information flow and coordination needed to make circular business models easy to adapt. A single firm may have little information upstream beyond its direct suppliers and downstream beyond its direct buyer.

3. Waste from production processes, as well as at "end of life," presents specific challenges as well. Currently there are numerous directives on how waste should be handled and, while well-intentioned, many of these are remnants of the "linear economy mindset" in which waste is to be disposed. Re-pricing waste and injecting flexibility into its handling can help stimulate different, more creative approaches to extracting value from by-products and reusing them in industrial processes.

"Supply chains today are so fragmented across borders and companies, potentially making the task of changing mindsets more difficult. On the bright side, Asia's factories are an incredibly resourceful, adaptive and resilient lot – they had to be in order to survive the pace of change thus far. So if the commitment to circular economy thinking among brands and buyers is real, the supply chain stands a good chance of adapting successfully."

PAMELA MAR
Fung Group

4. Despite the challenges above, global supply chains – which have become highly adaptable, flexible and resilient to changes – may hold great potential in advancing the circular economy agenda. First, the idea of extracting additional value from waste should be natural for supply chains that were set up to deliver efficient use of resources – what is often missing is the industrial infrastructure to reuse by-products. Second, in key production locations, supply chains are already responding to the rising cost of inputs, such as electricity and water, and additional guidelines on waste, thereby providing even more incentive to make the most of every part of the production process. Third, the logistics services that enable supply chains to operate smoothly across many geographies, can also be put to work to support circular economies through the optimization of reverse networks. Lastly, global brands that control vast global supply chains are increasingly familiar with concepts of circularity in production, equipped with the right leadership, design products and services to support these new business models.

5. There is potential for China to lead the adoption of circular economies in Asia, and possibly globally. China has the economies of scale and diversity in production processes to make remanufacturing and materials reuse economically viable, particularly for small and medium sized manufacturers. Though China enacted its first Circular Economy Promotion Law in 2009, much more policy leadership will be essential to bring the circular economy to fruition in the country. This should include removing regulatory rigidities around waste in order to encourage competition and facilitate the flow of materials, defining circularity beyond a narrow concept of recycling.

6. Overall, there is room for optimism in the economy's ability to innovate and change habits. Judging from the speed and frequency at which supply chain innovations have occurred, what we talk about today may be commonplace in the very near future.

Infrastructure and Urbanization

1. Infrastructure is an important facilitator of the circular economy – for example through clustering of remanufacturing networks and the creation of economies of scale in waste management, remanufacturing and other services. The same can be said about urbanization, which allows economies of scale to develop around waste, recycling and other consumer services. However, while the knowledge and technology may exist to achieve the above, the practice of designing and building infrastructure that accommodates a scaling up of circular economy networks, will take time to emerge.

2. Asia is rapidly urbanizing, and many countries are stepping up investment in infrastructure. However, much of the planning for infrastructure and urbanization suffers from distorted incentives, lack of sufficient funding, fragmented planning processes even within governments and lack of consultation with the business community. As a result, infrastructure and spending are not optimized, failing to be sufficiently forward-looking to address new business models such as the circular economy.

> "Business of course needs to be responsible, but we will still need better policy to really "move the needle" on the circular economy. For example, Japan's commitment to reduce waste is both structural – in terms of limited space and natural resources – and policy-driven, which produced the innovation of "deconstructing" skyscrapers."
>
> ANDREW LEE
> IMC Pan Asia Alliance Group

3. In China, inefficient infrastructure may be the result of distorted incentives. Less capital-intensive infrastructure has been neglected by some governmental planners in order to achieve higher GDP growth targets. As a result, in some cities, such as Foshan in the Pearl River Delta, the capacity of waste water treatment facilities exceeds that of waste water transmission pipelines, which have a lower capital cost and are thus less "GDP-intensive," leading to inefficiencies in the system's operation.

4. On waste recovery, consumer behavior as well as business practices are key in transitioning towards a circular economy, even with the right infrastructure. Businesses must raise awareness among consumers, provide information and convenience for their behavior change and collaborate with government to make sure that the right infrastructure is in place to accommodate changes in consumer behavior.

5. In some cases, businesses may have to build the needed infrastructure or at least proactively engage public financing agencies to provide the right support. This may be particularly the case in least developed economies where public resources and capabilities may be stretched.

6. Lessons could be drawn from cases in Taiwan and Hong Kong. Taiwan, with the help of government planning, has reduced household waste by 50 to 60 per cent in recent years, and has shifted food waste treatment from incineration to composting. In Hong Kong, a public bus company updates engines for higher efficiency and lower emissions rather than replacing entire fleets, therefore lengthening bus lifespan and saving materials costs.

7. Hong Kong's compact urban landscape has contributed to efficiencies in transport and land use, and may hold opportunities for creating a sharing economy of consumer goods. However, information to guide people's saving behavior needs to be better disseminated, and infrastructure for waste collection, reuse and recovery (including recycling bins and used material exchange platforms) needs to be set up. In a rapidly developing Asia, efficient information exchange will significantly facilitate circular economy development and promote environmental efficiency.

Policy and Social Dimensions

1. Work done by the Ellen MacArthur Foundation and others has demonstrated the business rationale for pursuing a circular economy, providing companies with the motivation to accelerate the transition. However, collaboration across businesses, sectors and geographies is critical to this change. Regulation and policy can enable the change, and can be even more effective if these are joined up with other initiatives that support economic development and environmental protection.

2. Reconsiderations in trade policy may be needed to enable circular economy products and materials to flow across geographies. For example, a number of countries currently ban the imports of remanufactured and other second-hand goods, as well as certain waste streams, arguably because of a lack of confidence in the value of these products.

> "Many government policies on waste, for instance, specifying how different types of waste should be handled may have been well intentioned when they were instituted. But they are vestiges of a linear economy mindset and actually are barriers to anyone trying to repurpose the waste. We need to re-think regulation with the circular economy framework in mind, and free up business to act."
>
> CHARLES HUANG
> Continental Holdings

3. A useful approach would be to relax these rules while ensuring the quality of the streams.

4. When moving to a circular economy, services will become increasingly important. However, these currently tend to be more strictly regulated than manufacturing. This should be adapted to support the transition.

5. Top-down regulation, however, should not be the only approach forward. Indeed, certain frameworks may be better driven by industries themselves. For example, defining standards of circularity would be useful, and could help facilitate linkages and materials cascading between companies and industries. Within a single industry, for instance, companies could work together to agree on common standards for use and reuse of a fixed range of materials in support of circular business models. These collaborations raise questions about competition laws, and may also require adapted regulatory and industry frameworks.

"Finance can provide a catalytic role in enabling opportunities in the circular economy, such as lease financing and product innovation. Private equity and development institutions could take a lead in the early statges to build out the market."

KATY YUNG
RS Group

6. Policies can also support consumer engagement. For example, adequate regulations could provide consumers with confidence over the quality of remanufactured goods. This could in turn help lift a stigma that these products might have for consumers in emerging countries.

7. Finally, Asia, and China in particular, includes a wide variety of cultures. This diversity should be taken into account when considering policies. There is no one-size-fits-all solution. For example, the strong policy-driven approach to the circular economy in Japan would probably not apply directly to other Asian countries. In China, state-owned companies could serve as an initial lever for the transition.

Finance

1. The transition from a linear to a circular economy in Asia will require substantial investments in both company and public infrastructure. It faces similar challenges as 'green' investment, including lack of expertise, metrics, creativity, and an enabling policy framework. The challenge is to break silos in the finance community and mobilize capital into this new market.

2. For SMEs, access to financing is already a challenge across the region, with many having to make recourse to shadow banking systems where high interest rates prevail. More awareness on the part of financial service providers, investors and private equity professionals about the circular economy model and its related businesses can help

unlock financing in this area. Models such as impact investing, microfinance or "bottom-of-pyramid" approaches, may be helpful as well.

3. Financing larger infrastructure projects, such as remanufacturing or disassembly plants, is hindered by uncertainty in future revenue streams, as well as policy risks that can affect the business model, such as changes in municipal waste management policies.

4. Leasing and service-based models, which are a significant part of the circular economy, may not be well understood by financiers since they do not fit neatly into traditional financial models built primarily around hard assets that are amortized. Greater creativity is needed to structure such loans.

5. Overall, the mispricing of externalities, for example water, waste and carbon emissions, may also lower the incentive for taking up circular economy projects. A better understanding of the returns, for instance in the form of avoided externalities or taxes, can help improve the sector's attractiveness both for businesses and financiers.

6. Institutions such as the International Finance Corporation and regional development banks can play a key role in filling financing gaps towards a circular economy in the region. Instruments such as green bonds can also be considered. Pension and insurance funds, and other entities that are naturally geared towards long-term returns, may find elements of the circular economy model attractive due to its capacity to increase resilience – if the investment vehicle, risk management framework and return profile are structured in an acceptable way. In the short term, this may require project guarantees or credit enhancement from government bodies, insurers or other third parties.

"Investors and lenders may be unlikely to support a new business trend unless there are compelling commercial reasons for it. The circular economy is a completely new concept to most people. It's very broad, and covers a wealth of disparate actors and projects. As more data become available, and a track record is demonstrated, this will change. But in the short term, lack of awareness and expertise is likely to constrain financing activities."

ALEXANDRA TRACY
Association for Sustainable and Responsible Investment in Asia

7. Policy can further help in areas of consumer and investor education, providing overall guidance – for example by stipulating remanufacturing as a new strategic industry – that can aid financial forecasting and instill confidence among financiers.

8. Overall, Asia is still an attractive market to investors, due to the potential for high returns, scale and growth in general. Financial centers, such as Hong Kong and Singapore, carry a wealth of talent and experience that offer fertile ground for shoring up financing in this new market.

ACCELERATING THE TRANSITION IN ASIA

China and Asia are experiencing economic growth at a speed and scale the world has never seen. This is accompanied by rapid urbanization, infrastructure development, strains on natural resources and pollution challenges. This trend presents both a challenge and an opportunity for circular initiatives: the speed of development makes it difficult to ensure that comprehensive planning is taking place, and at the same time it offers tremendous potential for leapfrogging to a circular system, learning from the experience of other markets and avoiding getting locked into a linear model.

The policy and regulatory frameworks of China and Asia present further barriers and opportunities. Trade policies, particularly those relating to used and remanufactured goods, in some cases prevent the flow of valuable goods because they are not treated as potential resources or inputs. An outdated wish to protect vested interests may also be a factor. This can be a barrier to circular practices when it concerns products such as remanufactured engine cores and some industrial and post consumer by-products. Other factors such as a landfill taxes, absent in some municipalities and countries (Hong Kong for example), have the potential to drive new innovation for circularity.

Circular economy and related concepts are already incorporated in the policy systems of certain countries, such as China and Japan. These initial steps should be leveraged to accelerate the transition, as laid out in this report.

Finally, Asia presents a diversity of cultures. An approach that is successful in one part of the region cannot always be applied to another. The region's history and civilizations also set it apart from the Western world at some cultural levels, which could for example impact consumer preferences. These differences should be acknowledged and taken into account. Learning from these insights, these next steps would be especially relevant:

Engaging Businesses

One of the major strengths of the circular economy model is that it delivers significant benefits for businesses. Rather than requiring strong top-down control, the transition to a circular economy can largely be driven by companies' initiatives. In order to engage Asian businesses in exploring the potential of the idea, the benefits should be actively demonstrated, for example through the creation of communication and collaborative problem solving platforms.

Engaging Governments

A circular economy would support the economic development of Asian regions by substantially reducing their dependence on material inputs and energy-intensive resources, providing opportunities for innovation. While the model can be largely driven by businesses, support from governments would greatly facilitate the transition, for example through education and training, infrastructure and enabling policy (such as regulations, taxes and other incentives). As a consequence, engaging governments at regional and national levels throughout the continent is an important next step.

Enabling Data and Analysis

Accessing reliable baseline data for China/Asia will be important for companies and governments in order to understand the business case for the transition to a circular economy. For example, information on material stocks and flows, potential material price increases and volatility, and the impact of these factors on rapidly growing Asian economies will be significant in driving company innovation and adopting new circular economy models.

In addition, the unique characteristics of Chinese/Asian markets and circular economy opportunities need to be better understood. For example, the impact of rapid urbanization, development of new infrastructure and the take-up of new technologies will create both new challenges and opportunities for new circular economy services, business models and end-of-life product recovery, reuse, re-processing and recycling. Understanding the potential for circular economic models in this Asian context presents the potential for leapfrogging linear consumption and disposal models that have evolved and matured in other markets over much longer timeframes. Understanding this potential will require incumbent companies and emerging disruptive innovators to apply the models appropriately to Chinese and Asian consumer preferences, as well as effectively leveraging existing factors such as infrastructure and business practices.

The implementation of circular economy concepts is just beginning. More knowledge and experience, in addition to policy changes and new financing schemes, will help businesses and society understand and fully exploit the potential of this model. At the very least, the initial evidence shows that companies can save money, markets can create new efficiencies, and communities can improve their environments by moving in the direction of a circular economy.

ABOUT THE ELLEN MACARTHUR FOUNDATION

The Ellen MacArthur Foundation was established in 2010 with the aim of inspiring a generation to re-think, re-design, and build a positive future through the vision of a circular economy, and focuses on three interlinking areas to help accelerate the transition towards it: Analysis – Providing robust evidence about the benefits of the transition; Business – Catalyzing circular innovation across the economy; and Education – Inspiring a generation to re-think the future.

For more information, please visit www.ellenmacarthurfoundation.org

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