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Greening SMEs as the basis for moving towards circular economy and sufficiency economy

(Background Paper for Plenary Session 4 of the Programme)

Final Draft

This background paper has been prepared Dr. Venkatachalam Anbumozhi, for the Ninth Regional 3R Forum in Asia and the Pacific. The views expressed herein are those of the author only and do not necessarily reflect the views of the United Nations.

Greening SMEs as the Basis for Moving Towards Circular Economy and Sufficiency Economy[1]

Venkatachalam Anbumozhi[2]

Summary: *The circular economy economy concept is coming into practice in many Asia-Pacific countries. In these concepts, materials are kept within use for as long as possible through actions such as recycling and remanufacturing. Sufficient economy fits the concept when it come using residues and waste materials as feedstock. There are benefits from these concepts consistent with the recent emergence of resource efficiency and competitiveness of Small and Medium sized Enterprises (SME)s. This paper reviews the opportunities available with SMEs for transition to circular and sufficient economy. Based on the analysis of it recommend that policy makers should target innovative green- SMEs as an effective platform to promote financial de-risking while addressing circular economy and sufficiency economy goals. This should be achieved by creating signals for private investors through: (i) a reporting system that can help monitor the scale-up of green- SMEs; (ii) the use of public funds to signal innovative green SMEs to investors; and (iii) the inclusion of SMEs in the design of green finance platforms. By implementing these recommendations, the Asia-Pacific region would ensure that greening SMEs become the basis for attractive, low risk investment opportunities for the private sector, and thus economy wide transition to circular and sufficiency economy.*

1.Introduction

Small and Medium-sized Enterprises (SMEs), including micro-enterprises, are core engines of transition to circular economy through innovation and economic growth. Small, medium and micro-sized enterprises are non-subsidiary, independent firms which employ fewer than a given number of employees. This number varies across countries, but the most frequent upper limit designating a medium size enterprise is 250 employees. Small firms are generally those with fewer than 50 employees, while micro-enterprises have at most 10, or in some cases 5, workers. SMEs are also often defined by relying also on financial assets. For instance, in the European Union, the turnover of medium-sized enterprises (50-249 employees) should not exceed EUR 50 million; that of small enterprises (10-49 employees) should not exceed EUR 10 million while that of micro firms (less than 10 employees) should not exceed EUR 2 million. Alternatively, balance sheets for medium, small and micro enterprises should not exceed EUR 43 million, EUR 10 million and EUR 2 million, respectively (OECD 2005). Within this type of firms, green SME is an enterprise whose business model includes: (i) any product, process or service designed with the primary purpose of contributing to remediating or preventing any type of environmental damage; and (ii) any "product, process or service that is less polluting or more resource-efficient than equivalent normal products that furnish a similar utility." The primary use of the latter is not one of environmental protection (NRC 2017). Conversely, an eco-efficient SME is an SME that has reduced its environmental footprint and has made its operations climate resilient. Green SME entails delivering competitively-priced goods and services which satisfy human needs and bring quality of life, while reducing ecological impacts and resource intensity (Lehni et al. 2000).

Through job creation and enhancing social capital for local development, they contribute for sufficiency economy. In the Asia-Pacific , SMEs undertake most of the private economic activity, and account for more than 60 percent of employment and around 30 to 60 percent of GDP (Table 1).

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Table 1, SME share of industry, Exports and Outputs in major Asia-Pacific Countries

	Share of all enterprises	Share of exports	Share of output
Bangladesh	99.0	-	25
Cambodia	99.8	-	-
China, People's Republic	97.3	-	-
India	-	42.4	37.5
Indonesia	99.9	15.7	60.3
Japan	99.7	-	43.7
Kazakhstan	96.1	-	23.1
Korea, Republic	99.9	18.8	47.6
Malaysia	97.3	-	35.9
Philippines	99.6	-	35.7
Singapore	99.4	-	45.0
Sri Lanka	99.5	20.0	30.0
Thailand	99.7	26.3	39.6
Vietnam	97.7	-	-

Source: compiled by author

The concept of the circular economy reflects the recognition that systems of production and consumption by SME need to be transformed fundamentally to achieve the 2030 agenda and Paris Agreement goals. This is because Asia-Pacific economic growth depends on uninterrupted flow of natural resources and materials, including water, timber, metals, minerals and energy carriers of SMEs, with imports providing substantial proportion of these materials in many countries. Increasing, this dependency could be a source of vulnerability. Uncertain and unstable prices can also disrupt the operations and profit margins of SMEs, forcing companies to lay off people, defer investment or stop providing goods and services.

2. SMEs as a Basis for Circular and Sufficiency Economy

Creating a circular economy for SMEs can help to address many economic, environmental and social challenges. Unlike the traditional linear take-make -consume-dispose approach, a circular economy at SME either on the.

Table 2. SME focus Circular economy business models at Micro, Meso and Macro levels

	Micro (single SME entity)	Meso (symbiosis association at SME cluster level)	Macro (economy -state)
Production area (primary, secondary, and tertiary industry)	Cleaner production Eco design	Eco-industrial park	Regional circular economy network
Consumption area	Green purchase and consumption	Environmentally friendly park	Renting/sharing service
Waste management area	Product recycle system	Waste trade market Venous industrial park	Urban /Rural symbiosis
Other support	Policies and laws; information platform; capacity building		

Source: Anbumozhi and Kimura (2018)

value chain or at cluster level seeks to respect planetary boundaries through increasing the share of recyclable resources while reducing the consumption of raw materials and energy and at the same time cutting emissions and material loss. Approaches such as eco-design and sharing, reusing, repairing, refurbishing and recycling existing products and materials will play a significant role in maintaining the utility of products, components and materials and retaining their local value and hence contributions to sufficiency economy. Indeed, sufficiency Economy is a philosophy that stresses the a development path as an overriding principle for appropriate conduct by the populace at all levels. 'Sufficiency' means moderation, reasonableness, and the need for self-immunity to protect from impacts arising from internal and external change. To achieve sufficiency, an application of knowledge with due consideration and prudence is essential. In particular, great care is needed in the utilization of theories and methodologies for planning and implementation in every step. At the same time, it is essential to strengthen the moral fiber of the development process, so that everyone adhere first and foremost to the principles of honesty and integrity. In addition, a way of life based on patience, perseverance, diligence, wisdom and prudence is indispensable in creating balance and in coping appropriately with critical challenges arising from extensive and rapid socioeconomic, environmental, and cultural changes.

At present there is no recognized way of measuring how effective SME is in making the transition to circular and sufficiency economy, nor are there holistic monitoring tools for supporting such process. A monitoring framework across micro, meso and macro levels (Table 2), as well as individual indicators (Fig 1) across three different policy areas of economic, environment and social could able to bench mark SMEs to improve their business investment decisions. Such frame works could also provide meaningful answers to policy questions covering Greening SMEs as the basis for moving towards Circular Economy and sufficiency Economy.

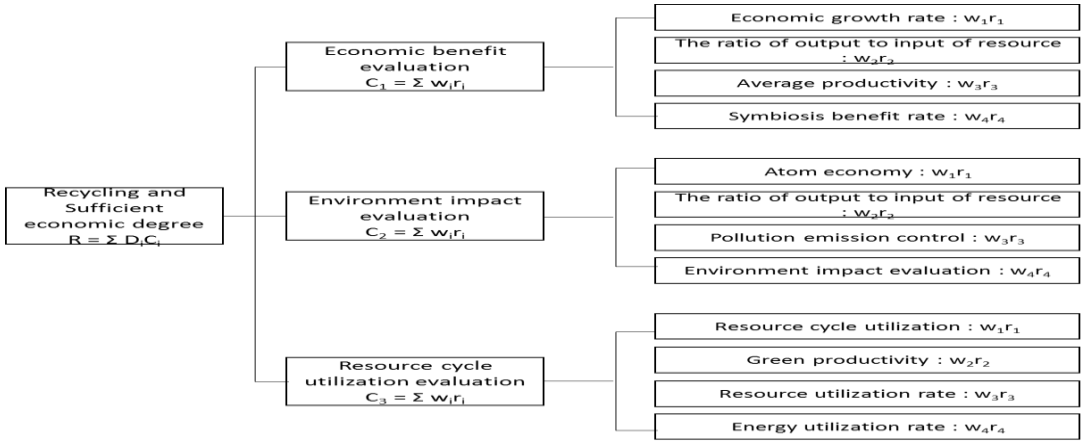


Fig 1. A multilayer indicators systems to measure the efficiency of circular and sufficient economy
Source: Anbumozhi and Kim (2018)

3. Technology and Finance Imperatives for Greening SMEs

On the other hand, the technology profile of SMEs also needs to be strengthened. Table 3 indicates that practices like open dumping and open burning of SMEs are practiced in countries, where recycling rate is less than 50%. Circular economy absorption and d recycling rates are very low, especially in the least developed countries of the Asia-Pacific, although there are large differences across countries.

Table 3. Technology Gaps and Recycling rate in ASEAN countries

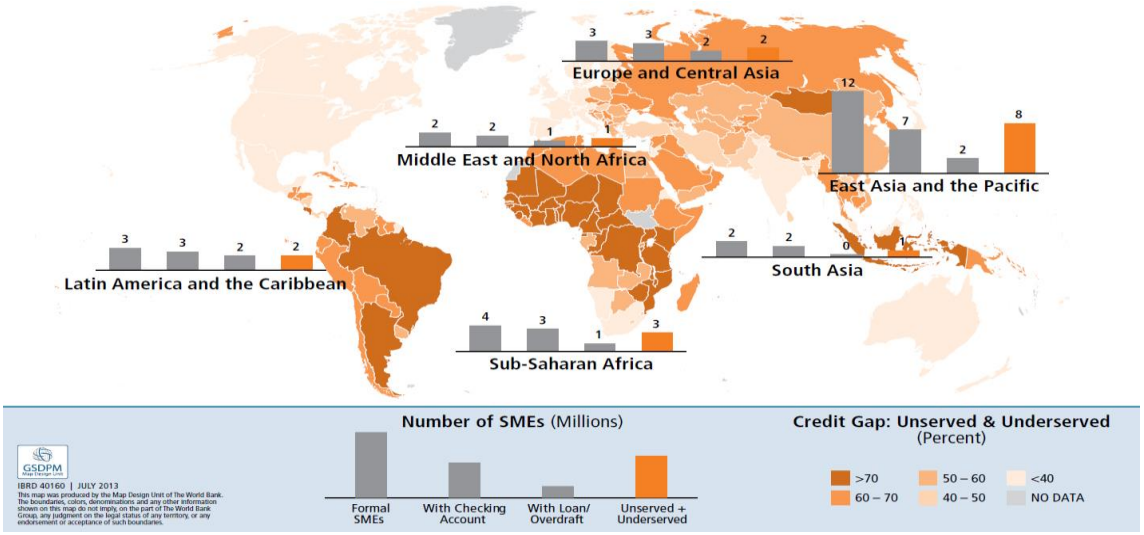
Country	Source Segregation	Collection Rate (Urban)	Technology Recycling Rate	Technology Gap Treatment/Disposal: Composting	Incineration	Sanitary Landfill	Open Dump	Open Burning
Brunei Darussalam	<50%	90%	15%			☐	⊔	
Cambodia	<50%	80%	<50%	✓		☐	⊔	✓
Indonesia	<50%	56% - 75%	<50%	✓	✓	☐	⊔	✓
Lao PDR	<50%	40% - 70%	<50%	✓		☐	⊔	✓
Malaysia	<50%	>70%	50% -60% (Metal, Paper, Plastic); Others (<50%)		✓	☐	⊔	
Myanmar	50%		70% (Plastic, Paper, Metal)		✓	☐	⊔	
Philippines	50% - 70%	40% - 90%	20%-33% (Paper) 30%-70% (Aluminum) 20% - 58% (Other Metals) 23% - 42% (Plastic) 28% - 60% (Glass)	✓		☐	⊔	
Singapore	70%	>90%	50% - 60% (Paper, Horticulture) >90% (Fe, CandD, Used Slag) >80% (Scrap Tire) >80% (Wood) >50% (Others) Overall (60%)		✓	☐	⊔	
Thailand	<50%	>80%	>90% (Metal) 50% - 60% (Paper, Construction) <50% (Others)	✓	✓	☐	⊔	
Viet Nam	<50%	80% - 82%	>90% (Metal) >70% (Plastic, E-waste) 50% (Paper) <50% (Others)	✓			⊔	

Source: UNEP (2017)

In this paper, it has been argued that Asia-Pacific countries need to recognize and engage SMEs, and especially circular SMEs, as key economic actors in the effort toward climate mitigation and sustainable development. Failing to bring them on board or designing strategies that do not consider the challenges and barriers they face, significantly reduces the chances of successfully attaining UN Sustainable Development Goals and the commitments made at the Paris Agreement.

4. Credit Gaps for Greening SMEs

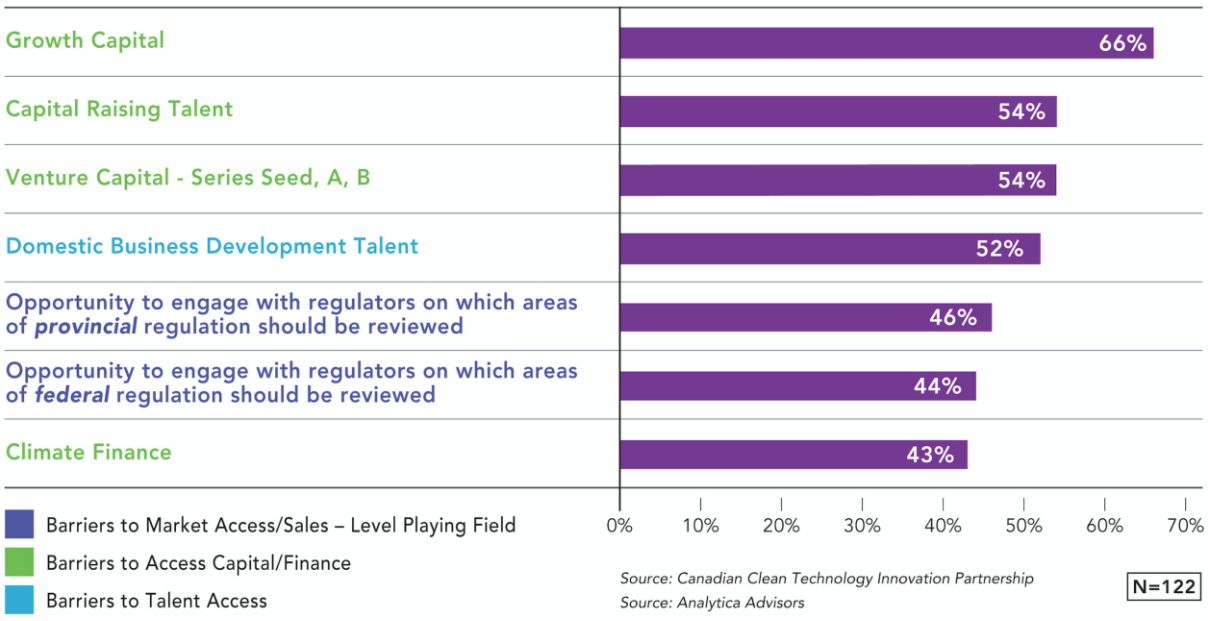
One major long-standing hurdle for SMEs has been the lack of appropriate forms of finance, with the severity of financing constraints varying across countries and sectors. A recent World Bank report estimates that the percentage of SMEs unserved or underserved by the formal financial sector is between 19 and 23 percent in developed economies and rises to 26–32 percent in developing countries (Stein et al. 2013). This amounts to a credit gap of around 1 trillion USD, which rises to over 2 trillion USD if informal SMEs and micro-enterprises are taken into account (Figure 2).



Source: Stein et al. (2013) based on data from IFS Enterprise Financing Gap Database 2011.

Fig 2 Total credit gap for SMEs

As most green or circular technologies have relatively high ratio of up-front to operating costs, their viability is particularly sensitive to SMEs. These financing constraints and barriers to private capital have an even more decisive impact on innovative green SMEs looking to deploy circular solutions to reduce their operations' resource intensity (i.e. circular SMEs), as illustrated in Figure 3. Green SMEs face issues similar to those of sustainable infrastructure projects: their returns may accrue over a long-term horizon. Similarly, green SMEs need to have access to finance with long horizons (Lane 2017, Bak 2017).).



Source: Céline Bak

Fig 3 Barriers to growth for SMEs commercializing green innovations

Indeed, many firms now engaged in commercializing solutions to circular economy or sufficiency economy must seek out markets where they can both improve environmental performance and do so at a cost lower than current business baselines. This is because today inefficient fossil fuel subsidies, create disincentives to quickly adopt green innovation. Asia Pacific now provide roughly $444 billion a year in subsidies for the production of fossil fuels (Bast et al. 2015). SMEs wanting to adopt circular models. Improve efficiency and reduce carbon emissions from their own operations must simultaneously open both the innovation and financing windows. Access to finance is as important as access to technology when it comes to improving resource efficiency.

In this respect, two other key aspects merit consideration. First, Asia-Pacific countries must unlock the finance needed to enable the attainment of both Sustainable Development Goals and Paris Agreement commitments. This will require the scale-up of new green SMEs. Indeed, there is currently significant heterogeneity across sectors and countries, and the pace at which green are developed and deployed. An integrated approach to industrial policy across Asia-Pacific countries would provide a bridge to accelerate the dissemination of innovation (Ruet 2016). Accessing green finance will be a significant challenge for firms developing and commercializing innovative solutions as well as SMEs who must adapt to circular economy model. In many cases, the "technologies of tomorrow "may very well be developed and commercialized through firms that will start as SMEs.

On the other hand, lack of disclosure and transparency makes it impossible for financial markets to identify investment opportunities to move capital into green investments. As circular economy related financial disclosure increases, investors will identify three kinds of risk: (1) Physical risks (i.e., risks of economic and financial losses); (2) Transition risks (i.e., risks of financial losses related to regulatory and economic adjustments in a transition to a circular economy; and (3) Liability risks (i.e., risks that liability insurance providers have to

cover claims for losses arising from physical or transition risk (Tanaka et al. 2016). If information asymmetries are addressed, the solutions that green-technology SMEs can offer for physical risks will attract investment. Their innovations can form the basis of new business models that address transition risks. With access to green finance, SMEs may have a positive impact on liability risks. Indeed, this paper identifies financing green SMEs as one the strategies to kill many birds with one stone. Specifically, it suggest including SMEs in the effort to support becoming green circular as well as follow the path of sufficient economy as a way to (1) successfully achieve emission reduction and efficiency targets and (2) de-risk private financial investments by ensuring that innovative, green SMEs are identified as high-return, low-risk investments than firms investing in carbon-intensive infrastructure, processes and production.

The following three recommendations are put forward that will ensure that region can promote the financing of the transition towards circular economy and sufficient by leveraging SME focused innovations.

5. Policy Recommendations for Realizing Green SMEs, Circular and Sufficiency Economy Goals

1. Promote a reporting system to help monitor the scale-up of green SMEs

There is currently no means for SMEs to signal innovative projects that lead to circular economy and sufficiency economy, and their commitment to market or adopt green technologies, processes or business models. However, such signals will increasingly play an important role in a global economy where investments, partnerships and markets extend beyond geographical borders**.**

Policy makers countries have the unique opportunity to engage in promoting and designing a monitoring system that can lower financial asymmetries and signal green, innovative SMEs to domestic and international investors through low-carbon-related financial disclosure.

To this end, policy makers should:

(i) Track the health of emerging green SMES as well as the resilience of financial institutions to circular economy -test scenarios. An annual report on the emergence of green innovation SMEs and the capital they are attracting for demonstration of innovation at scale and for broad-based adoption, as well as their aggregate firm-level financial strength. These indicators should be included as part of monitoring the transition to circular economy for Asia-Pacific countries. This measure ought to be paired with informative, non-normative, circular and sufficiency scenarios stress-testing for banks and financial institutions, based on long-term scenarios as an indirect incentive to better capital allocation.

(ii) Promote systematic sharing of IP databases seen not as “protection” but “signaling” of green SME innovation. Indeed, beyond granting the owner a monopoly of use, patents can and do play other important roles. Of relevance for firms, and for SMEs in particular, is the fact that patents signal an innovative player in the market. Further, patents can be classfied into specific technology classes, and specifically in green technologies (Hascic and Mingotto 2014). Promoting the sharing of information on the firm’s patent portfolios – for instance, by publicizing what percentage of the firm‘s innovation is “green,” is an important market signal to separate green SMEs from other economic actors. Note that in this respect, SMEs often lack the human resources or training to access such databases, hence designing implementation focus groups and support strategies would be a crucial aspect.

2. Create level playing field for green SMEs in Circular Economy and Sufficiency Economy Finance Platforms

A G20 Taskforce on Financial Risk Disclosure has made recommendations on reporting climate risk for corporations, including banks and pension funds. Given that SMEs represent the backbone of the worldwide

economic system, it is crucial that they are included from the start in green finance platforms and in the design of risk disclosure.

SMEs should be included from the start in the design of any system meant to assess climate-related financial risk by addressing information asymmetries and increasing transparency. This is warranted for at least three reasons. First, unless SMEs are put in a position to successfully develop and implement circular solutions and sufficiency economy business models by accessing financing, economic growth in the Asia pacific countries will not be inclusive. Second, financial institutions and private investors are seeking sustainable investment opportunities. Innovative green SMEs can fulfil this role and hence, contribute to decreasing risk by providing an alternative to carbon intensive investments. Third, many SMEs developing green technologies have emerged from publicly funded Research & Development (R&D) as well as programs to fund scaled-up demonstration projects. Ensuring that these investments are included in green finance disclosure platforms will address parallel information asymmetries and will make it more likely that spillover benefits are garnered from public investments in innovation

Including SMEs in green finance platforms, and ensuring that they report on climate impact, will provide a powerful investment signal because it will ensure that investors are able to identify innovative green-SMEs. This in turn will (i) ensure finance information asymmetries are addressed for opportunities presented by green SMEs; (ii) accelerate the formation of capital markets around green technologies to adapt to circular; (iii) ensure publicly funded R&D returns to society through spillover benefits; and (iv) enable green SMEs to become engines of sustainable growth.

To this end, the Asia pacific countries should Invite the Financial Stability Board (FSB) to establish a platform to exchange experiences and develop approaches to disclosure on circular economy related financial risks (transition, physical and litigation). This platform should be chaired by finance ministries/central banks and involve all relevant stakeholders, including regulators, academia, finance, SME industry and relevant international financial institutions. The proposed platform should develop recommendations for mandatory circular and sufficiency economy related financial risk disclosure as well as its corollary, climate risk reduction from investment in green-SME projects.

3. Leverage Public Funds and Support to signal innovative Green SMEs to Private Investors

Governments and intergovernmental bodies can play a crucial role in mobilizing private capital by leveraging public funds and support to signal innovative, green SMEs to private investors. The role of government support of R&D to foster innovative technologies is undisputed, both in green technologies and overall. Further, given the challenges associated with the diffusion of sustainable technologies, an active role and engagement by government and intergovernmental bodies is a necessary component of a successful transition towards sustainability. However, public investment cannot come close to filling the financing gap for the circular economy transition, and a significant amount of private money must be mobilized to this end. Indeed, access to public funding for SMEs should be designed in such a way as to provide private investors with a clear signal that the SME receiving public support has been selected as one of the most innovative in green technologies.

To this end, the Asia Pacific countries should: Use public funding to de-risk the scale-up of circular innovation by SMEs. There are several examples of how public money and intervention which is meant to support innovative, green SMEs can be turned into a signal to mobilize private capital to support circular innovation by SMEs. These include:

(i) Public investment in demonstration projects and proof of concept at commercial scale. Public investment financing should indeed be targeted at green technologies and away from high-carbon ones. This would ensure that public funding is indeed channeled towards the improvement of resource efficiency, the provision of a healthy, unpolluted environment for the

work force, the mitigation of climate change, and more generally the scale-up and diffusion of low-carbon innovation (Anbumozhi et al. 2016). SMEs supported by public financing would then be able to use this as a signal when applying for private credit.

(ii) Public procurement budgets for green SMEs and requirements for major government suppliers to develop relationships with them. SMEs participating in public procurement should be able to use such signals as a guarantee of their innovativeness and potential when accessing private funding.

(iii) Dedicated credit lines. These can be established by a public entity such as government agencies and national development banks in cooperation with an international financial institution such as the World Bank, the Asian Development Bank, or the African Development Bank, to guarantee the performance risk of green SME projects for project developers and their bankers.

(iv) Risk-Sharing Facilities.Partial risk or partial credit guarantee schemes established by public entities to reduce the risk of SME financing from the private sector, enabling increased private sector lending to SME, low-carbon energy projects.

(v) Climate Mitigation and Environmental Performance Contracts. Public-sector initiatives, in the form of legislation or regulation, by one or more government agency to facilitate the absorption of required technologies by performance-based contracts using private-sector financing.

Indeed, many of these instruments are already widely used within some Asia pacific countries like Japan, Korea to target specific groups of entrepreneurs or sectors. For instance, the strategic Action Plan for ASEAN SME Development (SAPASD) has been devised as a part of ASEAN Economic Community (AEC) Blue print to engage the small and micro enterprises on issues of access to finance, technology development and human resource development, among others in order to enhance the resilience and competitiveness of SMEs (ERIA, 2014)

Designing similar mechanisms specifically targeting innovative, green SMEs, while addressing existing challenges and leveraging existing institutions, would contribute significantly to fostering circular and sufficiency . By following the recommendations presented in this paper, Asia-Pacific countries would strengthen policy signals in support of circular innovations, provide a de-risking strategy for private investors, promote transversality and provide exosystemic support to safeguard the investments in climate mitigation undertaken by clusters of emerging firms. Indeed, the measures outlined above would go far beyond the universe of Green SMEs.

Of course, the application of these instruments will very much depend on a number of specific characteristics, including country context, legislative and regulatory frameworks, existing circular innovation systems and service-delivery infrastructure, as well as the maturity of commercial financial markets. Indeed, to the success of the recommendations will depend on the harmonization of such policies across the Asia-Pacific countries. Such much needed harmonization will not only be beneficial for the region, but will also promote scale-up and green technology diffusion. To this end, policy makers will need to promote regional, cross-country regulatory packages for investment (Medhora 2016), as well as realign trade and FDI policies towards supporting circular products and processes.

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