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**Comparative assessment of resource efficiency policies and
programmes in Greening SMEs South Asia, South East Asia
and East Asia**

(Short Background Paper for Plenary Session 5 of the Programme)

Final Draft

This background paper has been prepared by Mr. Michikazu Kojima, for the Seventh 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.

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Background Paper

On

**Comparative assessment of resource efficiency policies and programmes
in Greening SMEs South Asia, South East Asia and East Asia**

**Michikazu Kojima
Chief Senior Researcher
Institute of Developing Economies
JETRO**

Summary/ Abstract

Small and Medium Enterprises (SMEs) in Asia have contributed to national economies. Although SMEs have contributed national economies, SMEs have faced two challenges to improve resource efficiency, namely, technical and financial challenges. SMEs have a limited technical capacity to improve resource efficiency and adapt to various environmental regulations. SMEs also have a limited access to financial resources to invest in improving resource efficiency and environmental protection measures. This background paper reviews the resource efficiency policies and programs towards greening SMEs in Asia. Some countries put special attention on SMEs in their legislation, plan or strategy on waste management, 3R, circular economy and green industry. Some countries also have cleaner production center which disseminate leaner production technology .which is likely to improve resource efficiency and energy efficiency. Some countries also have financial scheme to support SMEs for investing in improving resource and energy efficiency.

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1. Introduction

Small and Medium Enterprises (SMEs) in Asia have contributed to national economies. In terms of employment, shares of SMEs exceed 70 % in Japan, Republic of Korea, Thailand, Indonesia, Vietnam and Pakistan. SMEs have also contributed to GDP. SME Contribution to GDP in Japan, Republic of Korea, Indonesia, Sri Lanka reached 40%. SMEs share of total exports is also significant. The share in Japan, Republic of Korea and India exceeds 30% (See Table 1).

Although SMEs have contributed national economies, SMEs have faced two challenges to improve resource efficiency, namely, technical and financial challenges. SMEs have a limited technical capacity to improve resource efficiency and adapt to various environmental regulations. SMEs also have a limited access to financial resources to invest in improving resource efficiency and environmental protection measures.

Some countries such as China, Indonesia and Japan have legislation, strategy or plan for Circular Economy, Green Industry or 3Rs mention SMEs. Many countries in Asia also conduct technical and financial support for SMEs to improve resource and energy efficiency. International donors also provide technical and financial supports to developing countries.

This background paper reviews the resource efficiency policies and programs towards greening SMEs in Asia. The second section summarizes the attention on SMEs in national legislations, plans and strategies for 3R and circular economy in Asia and in declarations in this regional forum. Section 3 shows some programs focusing technical aspect of resource efficiency for SMEs. Financing SMEs for improving resource efficiency is discussed in section 4. In the annex of this paper, the useful information sources to improve resource and energy efficiency are listed.

Table 1 Contribution of SMEs to National Economies

	SME Share of Total Employment(%)	SME Contribution to GDP(%)	SMEs Share of Total Exports(%)
Bangladesh	40	22.5	11.3
India	40	17	40
Indonesia	97.2	57.8	15.8
Japan	70.2	50.0	53.8
Korea, Republic of	87.5	49.4	30.9
Malaysia	58.9	31.9	19

Pakistan	70	30	25
Philippines	61.0	35.7	20.0
Sri Lanka	35	52	20
Thailand	77.9	38.7	29.5
Vietnam	77.0	40.0	20.0

Source: Yoshino, Nobuyuki and Ganeshan Wignaraja(2015)

2. Attention on SMEs in National Legislation, Plans and Strategies for 3R and Circular Economy

Some countries put special attention on SMEs in their legislation, plan or strategy. China enacted Cleaner Production Promotion Law in 2002. Article 34 of the Law states that Small- and Medium-Sized Enterprise Development Fund shall be set aside to support cleaner production for small- and medium-sized enterprises in accordance with their needs.

Indonesia enacted Law Number 3/2014 Regarding Industrial Affairs, which define green industries as the industry in the production process prioritizes the efficiency and effectiveness of the use of resources in a sustainable manner (Article 1). The act also mandates central and regional governments to provide environmental pollution prevention assistance to SMEs (Article 72 and 74).

Japan established Basic Act for Establishing a Sound Material-Cycle Society in 2000. Based on this act, Plans for Establishing a Sound Material-Cycle Society have been formulated. The latest plan formulated in 2013 lists up the number of companies getting Eco-action 21 certification which is an environmental management system for small to mid-sized companies, as one of target indicators.

Some countries provide information in country report submitted to the last Regional 3R forum, about major clean energy technology related policies aiming to increase energy and resource efficiency in SMEs (See Table 2).

Table 3. What are the major clean technology related policies aiming to increase energy and resource efficiency of SMEs?

Afghanistan	None so far.
Australia	The Water Efficiency Labelling and Standards scheme
Bangladesh	National 3R Strategy for Waste Management, 2010 National Renewable Energy Policy- 2008 Policy Strategies for SME Development 2005

Bhutan	National Environment Protection Act of Bhutan 2007 Env. Impact Assessment Act of Bhutan 2000 and Regulation 2002 Waste Prevention and Management Act 2009 and Regulation 2012 National Solid Waste management Strategy 2014
Indonesia	Set up of Ministry of Industry Decree regarding Road Map of CO2 Emission Reduction in Cement Industry and Ozone Depleting Substances Abolition. Set up of Technical Guidance for Energy Conservation Technique and CO2 Emission Reduction for steel, fertilizer, pulp & paper, and ceramic industries. Training on Green Industry Implementation for Industry (including SMEs). Technical and Financial Support for Green Industry Certification. Green Industry Expo and Green Industry Campaign.
Mongolia	None
Myanmar	Industrial policy No.(4) - Efficient Utilization of available natural resources and promotion of value-added products based on locally available natural resources.
Singapore	Energy Efficiency National Partnership Singapore Certified Energy Manager Programme & Training Grant
Thailand	The cleaner technology mechanisms have been prepared to help increase the competitiveness of the industry and to conserve the environment at the same time.
Viet Nam	Law on energy efficiency Decision of the Prime Minister on approval the National Target Program on energy efficiency for period 2012-2015 Resolution of the 7th Conference of the 11th Central Party Committee on Proactive responses to climate change, enhanced natural resource management and environmental protection

Source: County Reports from each country submitted to the Sixth Regional 3R Forum in Asia and the Pacific.

Recommendation and Declarations adopted by the regional 3R forums in Asia also highlighted SMEs(Table 2). Recommendations adopted by Singapore Forum recommend countries to support private sector including SMEs to implement resource efficiency measures.

Table 2. Recommendation and Declarations in the Regional Forum mentioning

SMEs

Name Declaration	Paragraph mention to SMEs
Recommendations of the Singapore Forum (2011)	The countries could consider the following. - Develop policies and provide necessary support and incentives that encourage the private sector to implement resource efficiency measures. Such efforts will be advantageous for the industries, including small and medium enterprises (SMEs), as it will result in cost savings and better international competitiveness.
Ha Noi 3R Declaration (2013)	Goal 5: Encourage the private sector, including small - and medium - sized enterprises (SMEs) to implement measures to increase resource efficiency and productivity, creation of decent work and to improve environmentally-friendly practices through applying environmental standards, clean technologies, and cleaner production.
	Goal 8: Build local capacity of both current and future practitioners, to enable the private sector (including SMEs) to obtain the necessary knowledge and technical skills to foster green industry and create decent, productive work.
Surabaya Declaration (2014)	Underscoring the fact that moving towards a resource efficient and sound material cycle based society will require considerable and sustainable investment and resource mobilization, including technological interventions, institutional capacity-building, and development of 3R infrastructures, programmes and projects (eco-industrial zones, science parks, eco-cities, waste recovery facilities, waste-to-energy schemes, greening small and medium enterprise (SME) operations, green products and eco-labelling schemes, biomass to composts and energy in rural areas, etc.)

Adapted from: Regional 3R Forum in Asia and the Pacific
<http://www.uncrd.or.jp/index.php?menu=389>

In Ha Noi 3R Declaration, indicators related to SMEs are listed in relation with Goal 5, Goal 8 and 13, which are (1) the number of SMEs receiving expert advice, training, and other support from the Centre of Excellence for resource efficiency, (2) annual government expenditure on building capacity of SMEs in promoting

environmentally-friendly technologies and practices and (3) technical support services made available to informal sector and SMEs involved in e - waste management, that have raised awareness of workers and employers on the hazards of e-waste management and recycling at all stages.

3. Programs focusing on Technical Aspect

Various countries provided technical support to SMEs on resource and energy efficiency. Technical supports include various types of technologies, such as more efficient production technology, more energy efficiency storage method, and technology converting waste to resources. Housekeeping is also covered, which can contribute to efficiency of workers. Technical supports covers not only hard technology but also soft technology such environmental management system and life cycle assessment.

Thailand has conducted Cleaner Technology project, which aims to technical capacity building of SMEs and practitioner in the area of cleaner production, resource efficiency, and environment-friendly technologies (Thailand Government, 2015).

Indonesia has conducted Green Industry and Energy Conservation Training for Industrial practitioners and government officials. Technical Assistanes were also provided to food, coating, fish canning, cosmetics, and electroplating industries. The project identify potential benefit of cleaner production in each industry. For example, food industries can save IDR 1,858,032,005 (143 thousand US dollar) annually by investing IDR 559,490,540 (43 thousand US Dollar) on efficient us water consumption and others. Fish canning industry can save IDR 977,500,614 (75 thousand US dollar) by initial investment IDR 119,053,750 (9 thousand US dollar), toward efficient use water, energy, packaging and rejected product (Indonesia Government 2015).

Indonesia has two training centers for cleaner production. One is Center for Resource Efficient & Cleaner Production Indonesia ITB(CRECPI), which is supported by UNIDO. And the other one is National Cleaner Production Center (Pusat Produksi Bersih Nasional: PPBN), which was supported by GIZ. .

Myanmar has conducted two projects on resource efficiency which are “Improvement of Industrial Energy Efficiency in Myanmar (IEE) Project” and “Resource Efficient and Cleaner Production (RECP) Project”, both of which are supported by UNIDO. (Myanmar Government 2015).

China National Cleaner Production Center was established in 1994, which is Established in 1994, which is affiliated with Chinese Research Academy of Environmental Sciences. They have conducted training, audit and R&D.

(<http://www.unep.fr/scp/cp/network/pdf/China%20NCPC.pdf>)

Vietnam Cleaner Production Centre (VNCPC) was established in 1998, which is affiliated with Hanoi University of Science and Technology. They have conducted various projects. In Promoting Resource Efficiency in Small Medium Enterprises (PRESME) project sponsored by UNIDO, 323 measures for resource efficiency and cleaner production were proposed to 12 enterprises. Among them 279 actions were implemented, which cost 7,630 billion VND (about 400,000 USD) for investment and made an annual savings to nearly 5,160 billion VND (271,000 USD/year).

With support of donors such as UNIDO, UNEP, USAID and GIZ, cleaner production centers were established in many developing countries. Cleaner Production Centers provide training, audit services, and research to find appropriate technologies. UNIDO(2015) pointed out that cleaner production centers need to partner with various stakeholders with government, industrial organization, research and education sectors in order to disseminate cleaner production to various industrial sectors in various locations.

There are two good examples to facilitate such collaboration in Asian region. First example is Cleaner Production Internship Program in Thailand. The program is jointly operated by government, universities and industries, which has contributed not only Cleaner Production technology transfer, but also human resource development of student interns and factory staffs. Cost of program is covered by government and private companies accepting student intern. In the program, after students have three days training, students conduct audits in a factory and propose cleaner production measures. After several months, students visit again factories to check if their suggestions are effective or not (Thumrongrut, 2009).

Second example is Fukuoka Research Commercialization Center for Recycling Systems, which was established in 2001 by Fukuoka Prefecture Government, in Japan. The center facilitates and supports cooperative research initiative among industry, academia, and government to develop recycling technologies and related social system. Their research results include fertilizer made from waste drying agents, a sponge-like high-quality lightweight aggregate made from waste glass, and compost quality index. The budget is coming from Fukuoka Prefecture Government. The research activity is supported by the local government.

4. Programs focusing on Financial Aspect

Even if the technological solution was identified, SMEs may not be able to invest in the alternative technologies, if they have severe budget constraints and lack of access to

financing. International Finance Corporation (2010) found that SMEs in lower income countries face more severe financing constraints than large firms and in higher income countries. For example, most of SMEs in Myanmar and Cambodia have no access to financial support from banks (Sanyal and Eisinger 2016, and Eisinger and Cochu 2016).

There are many green financing programs to support industries including SMEs in higher and middle income countries. Singapore has provided several financial incentives for industries to invest in energy and resource efficiency. For example, Design for Efficiency Scheme (DfE) provides co-funds up to 50% of a design workshop, capped 600,000 dollar, in which investors in new facilities to Singapore integrate energy and resource efficiency improvements into manufacturing development plans. Grant for Energy Efficient Technologies (GREET) supports industries to install energy efficient technologies or equipment. Co-funds for GREET is up to 20% of the qualifying cost, capped at \$4 million. (Singapore Government 2015). Development Bank of Philippines has Green Financing Programme, which assist industries and local government units in development and implementation of their green programs or eco-friendly projects. The bank also has Sustainable Solid Waste Management Program to assist local government units and private enterprises in development of their solid waste management program (Conde et.al. 2015) . These programs covers manufacturing sector including SMEs, but do not focus on SMEs.

Although Watanatada and Guett (2015) pointed out that the combination of both SMEs and green activities is not well targeted by policy makers. But there are few examples on financing programs for SMEs' investment on energy efficiency, resource efficiency, pollution control and production of environmentally friendly products. CIMB Thai Bank in Thailand has Clean Energy Loan, which eligibility criteria are SMEs. The objective of financing is promote energy efficiency measures for machinery and equipment and renewable energy projects. In Indonesia, Global Environmental Facility (GEF) Trust Fund provides low interest loan or loan guarantee for SMEs in manufacturing sector on energy efficiency technologies, through local banks and financial institutions. Krung Thai Bank in Thailand has term loan and working capital scheme for SMEs on energy saving products or production of environmentally friendly products (Watanatada and Guett (2015).

Watanatada and Guett (2015) also stress three categories of barriers for SMEs to access financing, based on case studies in Indonesia, Malaysia and Thailand. The first one is structural barriers, which means weak financial infrastructure and weak legal and regulatory framework. The second one is supply side barriers, such as lack of capacity to evaluate environmental aspect or technologies. The third one is demand-side barrier,

which include lack of awareness by SMEs on business model and of capacity related to resource efficiency

Based on reviews on previous literature, in lower income countries SMEs have difficulty to get financing not only on green investment but also on other investment and working capital in general. The structural barrier is the major obstacle for SEMs in lower income countries. In middle and higher income countries, some financial schemes are ready to provide financial support to SMEs in investing in resource and energy efficiency. But supply side barriers and demand side barriers still exist (Watanatada and Guett 2015). Capacity development for financial sectors and SMEs on resource and energy efficient technology should be strengthened.

In addition, Watanatada and Guett (2015) pointed out that both SMEs and financiers are lack of awareness on green technologies and processes. It is also found that dialogue among stakeholders including SMEs, financier and policy maker is not sufficient. Dialogue among stakeholders related on financing resource efficiency technology for SMEs should be promoted to identify appropriate policy intervention.

5. Conclusion

Lack of technical and financial capacity of SMEs to improve resource and energy efficiency undermines not only the environment, but also their competitiveness. Improvement of resource efficiency by SMEs can contribute the environment and national economy.

There are some good practices in Asian countries, both in technical and financial aspects. In addition, coordination between technical and financial support program should be strengthened (Grutter and Egler 2004).

But in general, many SMEs have difficulty to access to technical and financial support. Policy to support SMEs in various environmental aspects should be implemented.

6. References

- Cond, Cora D, Victor C. Abainza, Aberto B. Reyno and Arlene S. Orenca (2015) *Enabling SME Access to Finance for Sustainable Consumption and Production in Asia: An Overview of Finance Trends and Barriers in Sri Lanka and the Philippines*, ADFIAP and Switch-Asia.
- Eisinger, Frederik and Annica Cochuu (2016) *Enabling SME Access to Finance for Sustainable Consumption and Production in Asia: An Overview of Finance Trends and Barriers in Cambodia*, adelphi and Switch-Asia

- Grutter, Jürg M., Hans-Peter Egler (2004) "From Cleaner Production to Sustainable Industrial Production Modes" *Journal of Cleaner Production*, Vol. 12, pp.249-256.
- Indonesia Government (2015) "Country Report" submitted to Sixth Regional 3R Forum in Asia and the Pacific".
- International Finance Corporation (2010) *Scaling up SMEs Access to Financial Services in the Developing World*.
- Myanmar Government (2015) "Country Report" submitted to Sixth Regional 3R Forum in Asia and the Pacific.
- Mungcharoen, Thumrongrut (2009) "3R Policy and Related Activities in Thailand" in Michikazu Kojima and Enri Damanfuri (eds) *3R Policies for Southeast and East Asia*, Economic Research Institute for ASEAN and East Asia. (http://www.eria.org/publications/research_project_reports/images/pdf/y2008/no6-1/Chapter6.pdf)
- Sanyal, Sanjoy and Frederik Eisinger (2016) *Enabling SME Access to Finance for Sustainable Consumption and Production in Asia: An Overview of Finance Trends and Barriers in Myanmar*, adelphi and Switch-Asia
- Singapore Government (2015) "Country Report" submitted to Sixth Regional 3R Forum in Asia and the Pacific.
- Thailand Government (2015) "Country Report" submitted to Sixth Regional 3R Forum in Asia and the Pacific.
- United Nations Industrial Development Organization (2015) *National Cleaner Production Centres 20 years of Achievement – Towards Decoupling Resource Use and Environmental Impact from Manufacturing Growth*.
- Watanatada, Jackrit and Lydia Guett (2015) *Enabling SME Access to Finance for Sustainable Consumption and Production in Asia: An Overview of Finance Trends and Barriers in Indonesia, Malaysia and Thailand*, ADFIAP and Switch-Asia.
- Yohisno, Nobuyuki and Ganeshan Winaraja (2015) *SMEs Internationalization and Finance in Asia*, presentation at "Frontier and Developing Asia: Supporting Rapid and Inclusive Growth" IMF-JICA Conference in Tokyo, on February 18, 2015. <https://www.imf.org/external/np/seminars/eng/2015/jica2015/pdf/1-B1.pdf>

ANNEX: Useful Resources for Improving Resource Efficiency

- (1) United Nations Environment Programme (2010), PRE-SME – Promoting Resource Efficiency in Small & Medium Sized Enterprises : Industrial Training Handbook.
http://www.unep.org/pdf/PRE-SME_handbook_2010.pdf
- (2) UNIDO CP Tool kit
<http://www.unido.org/resources/publications/safeguarding-the-environment/industrial-energy-efficiency/cp-toolkit-english.html>
- (3) PREMANet Introducing Resource Efficiency Strategies to Small Businesses,
<http://www.smetoolkit.org/smetoolkit/en/content/en/54592/Introducing-Resource-Efficiency-Strategies-to-Small-Businesses>
- (4) European Commission (2013) “SMEs, resource efficiency and green markets”,
FLASH EUROBAROMETER 381.
http://ec.europa.eu/public_opinion/flash/fl_381_en.pdf
- (5) UNEP (2007) Energizing Cleaner Production: A Guide for Trainers
<http://www.unep.fr/shared/publications/pdf/DTIx0922xBA-EnergizingCP.pdf>
- (6) UNEP (2006) Applying Cleaner Production to Multilateral Environmental Agreements: A Training Kit
<http://www.unep.fr/scp/publications/details.asp?id=DTI/0899/PA>