

# THE BUSINESS OF GREENING

## POLICY MEASURES FOR GREEN BUSINESS DEVELOPMENT IN ASIA

*Daniele Ponzi*

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## The Business of Greening: Policy Measures for Green Business Development in Asia

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Daniele Ponzi

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# ABSTRACT

Strong economic growth in Asia and the Pacific in the last 50 years has improved living standards, health, education, and food security. However, economic activities have put pressure on critical environmental resources, resulting in degradation of natural capital, biodiversity loss, climate change, decline in land productivity, air and water pollution, and depletion of water supply, among others. Investment requirements to address these environmental challenges are staggering, and the current financing landscape, dominated by public sector funds, is inadequate. In response, policy makers in the region are putting in place new legislation and initiatives as part of a global push toward environmentally sustainable growth, among them, the 2030 Agenda for Sustainable Development (including the Sustainable Development Goals), the Paris climate agreement, the Sendai Framework for Disaster Risk Reduction, and the Addis Ababa Action Agenda. However, with limited public sector funds and development assistance, there is a need and an opportunity for the private sector to fill financing gaps for green investments over the medium to long term. This paper argues that there is enormous potential for scaling up green business development in Asia and the Pacific. Scores of green businesses are already leveraging private sector capabilities and resources. The paper reviews green markets, technologies, and practices with a focus on developing Asian countries, and offers a set of policy options to enable governments and development finance institutions to accelerate green business development in Asia, both through direct command-and-control measures and through indirect market-based instruments targeted at large firms as well as small and medium enterprises. The analysis suggests that advancing green businesses is a win-win proposition for all stakeholders, but this will require mobilizing vast resources of private capital and stimulating and deploying technological innovation. In the end, it will be up to Asian countries and companies to embrace the green “great transformation” or to continue prioritizing short-term profits from the region’s rapidly declining natural resource base.

JEL Classification: O13, O30, Q2, Q5, Q01

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# EXECUTIVE SUMMARY

## I. Introduction

As a result of strong economic growth in the last 50 years, hundreds of millions of people in Asia and the Pacific have been lifted out of poverty and the region is now home to a healthier, longer-living, and better-educated population. At the same time, many countries in the region have failed to grow in a way that is environmentally sustainable. As per capita incomes and consumption have risen, pollution levels have worsened, and natural resources have been depleted.

By degrading natural capital, economies are compromising vital ecosystem services, which include everything from food and water to services such as climate regulation and natural flood defenses provided by mangroves. These trends are threatening past economic and social gains on a vast scale.

Amid a range of environmental challenges, policy makers in Asia and the Pacific are increasingly recognizing that economic growth, decent living standards, and environmental sustainability are interconnected. In many countries, new legislation and initiatives are being put in place as part of a global push to make economic growth greener. The “green growth” model of development seeks robust economic growth while also ensuring that natural assets continue to provide the resources and environmental services on which long-term well-being depends.

With the passage of the 2030 Agenda for Sustainable Development (including the Sustainable Development Goals), the Paris climate agreement, the Sendai Framework for Disaster Risk Reduction, and the Addis Ababa Action Agenda, there is increased global momentum for green growth. Against this backdrop, high-income countries, both in the region and around the world, are leading the way in pursuing green-growth initiatives, while a number of middle- and low-income countries are challenging the “grow now, clean up later” approach and have also made commitments to green growth. Still, developing countries face many pressing challenges and have limited resources. While commitments exist on paper and overall policies are in place, supporting mechanisms and agreements for implementation are often slow-moving, missing, or ineffective. At the country level, the pathway to green growth depends a great deal on political will and public sector capacity, often driven by specific environmental pressure points, such as air quality in the People’s Republic of China, deforestation across Southeast Asia, and rising sea levels in the Pacific Island countries.

However, while it is up to governments to set the policy framework for green growth, only a small portion of the green investment requirements can come from domestic public sector funds and external official development assistance. To fill gaps in financing, there is a need for a much greater flow of investments from the private sector (both domestic and foreign direct investments) in environmentally sound practices and technologies in areas such as clean energy, sustainable transport, green cities, waste management, natural resources management, ecosystem services, biodiversity, and pollution prevention and control.

The challenge for the public sector is to bring the private sector to the forefront of the green-growth transition. Inherent in this challenge is the need to engage firms in innovative ways to go beyond increasing wealth for their shareholders to achieving the goals of social development and environmental quality. This paper reviews the region’s progress in meeting this challenge, along with some policy actions that governments can take to further accelerate green growth through green business development.

## II. Overview of Green Business

There is no universally accepted definition for “green business.” In this paper, the term is defined broadly as “any profit-oriented activity that supports environmentally sustainable growth.” According to this definition, green businesses can be classified into two main categories:

- First is the environmental goods and services sector, which, as defined by the Organisation for Economic Co-operation and Development (OECD) and the Statistical Office of the European Union (Eurostat), relates to firms whose activities “produce goods and services to measure, prevent, limit, minimize, or correct environmental damage to water, air, and soil, as well as problems related to waste, noise, and ecosystems.” This category includes technologies, products, and services that reduce environmental risk, and minimize pollution and resource degradation.<sup>1</sup>
- In the second category are greening businesses—firms taking active measures to change their products or processes, in view of the environmental sustainability agenda. These measures can be taken at various points in the life cycle of a product, and can extend throughout the entire supply chain of a good or service.

With respect to the first category, the increasing uptake of environmental goods and services, driven by advancements in technology, is paving the way to greener economies. These environmental goods and services are found in a multitude of sectors, each of which represents markets in the tens of billions of dollars and could one day rival mobile technology and wireless communication in size and scope. Recent annual estimates of the global size of green industries range from \$1.1 trillion to \$4.4 trillion, depending on the definition of green industry and also the methodology used.

While estimates of the global market for green goods and service vary greatly, there is agreement about Asia’s growing share of the market. According to data from the Department for Business, Innovation and Skills of the United Kingdom (now the Department for Business, Energy and Industrial Strategy), Asia has the largest value of green sales in absolute terms and per unit of gross domestic product, compared with other continents.<sup>2</sup>

In addition to the growing number of firms supplying green goods and services, many more companies are “greening” their businesses. Firms can integrate greenness into their business in different capacities and to differing degrees. Some are using greener inputs or selling more environmentally sustainable products and services, while others are transforming production and consumption patterns across entire value chains.

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<sup>1</sup> OECD/Eurostat. 1999. *The Environmental Goods and Services Industry: Manual for Data Collection and Analysis*. Paris. [https://www.oecd-ilibrary.org/industry-and-services/the-environmental-goods-and-services-industry\\_9789264173651-en](https://www.oecd-ilibrary.org/industry-and-services/the-environmental-goods-and-services-industry_9789264173651-en) (accessed 19 October 2018).

<sup>2</sup> UK Department for Business, Innovation and Skills. 2013. *Low carbon and environmental goods and services: 2011 to 2012*. <https://www.gov.uk/government/publications/low-carbon-and-environmental-goods-and-services-2011-to-2012> (accessed 20 October 2018).

The life-cycle model of green business innovation involves companies greening different parts of their value chain. Companies can take action at each of the five steps in the life cycle of a business: inputs, process, outputs, environmental externalities, and marketing.<sup>3</sup> Practices such as green supply chain management and green procurement focus on greening the upstream segment of a value chain, while the move to increase producers' responsibility and product stewardship is geared toward greening downstream functions.

At the farthest point are closed-loop systems, where in theory, materials and resources are recycled endlessly and waste and pollution do not exist. The “circular economy” concept involves a fundamental rethinking of products, materials, and whole systems. While this vision is still a long way from reality on a macro scale, industrial symbiosis is already happening. This involves sharing resources and by-products among industrial companies on a commercial basis through interfirm recycling linkages.

### III. Current Progress

Results of a recent corporate responsibility review by Oekom Research, a leading rating agency in the field of sustainable investment, show that, while firms that rate highly in environmental, social, and governance criteria are increasing, the private sector still has a long way to go before it can attain global sustainability targets. On the one hand, in its analysis and rating of 3,800 companies, Oekom noted an upward trend in average performance scores of companies in both developed and emerging economies from 2013 to 2017. In 2017, about 17% of rated companies were assessed as “very good” or “good” in terms of sustainability performance—a record high for the Oekom review series. In addition, about 44% of rated companies achieved medium-level performance scores, up from 35% in 2015 and 40% in 2016. Firms with low performance scores accounted for about 39% of rated companies, the lowest share in the history of the annual review. On the other hand, 36% of companies analyzed using Oekom’s Sustainability Solutions Assessment methodology were contributing to the achievement of the Sustainable Development Goals with their products and services. The food and beverage and oil and gas industries have been identified as poor environmental performers.<sup>4</sup>

In Asia, many firms that are greening their operations are motivated mainly by external pressures exerted by government policy or foreign investors and export markets, rather than by internal considerations. Green supply chain management initiatives are often another significant external driver, especially in sectors focused on producing consumer durables, metals, and electronics. Such initiatives are in response to heightened scrutiny of large multinationals’ supply chains. This means that businesses along supply chains have also faced increasing pressure to abide by more environmentally friendly practices.

A number of firms are turning environmental awareness into a source of competitive advantage. More and more Asian firms are adopting environmental management systems, seeking certification for their environmental practices from third-party organizations, such as the International Organization for Standardization (ISO), and participating in green business networks, both domestically and internationally.

<sup>3</sup> UK Department for Business, Enterprise, and Regulatory Reform/Ernst and Young. 2008. *Comparative advantage and green business*. London. [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/42972/1\\_20090501131921\\_e\\_\\_\\_\\_\\_ComparativeAdvantage.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/42972/1_20090501131921_e_____ComparativeAdvantage.pdf). Contains public sector information licensed under the Open Government Licence v3.0.

<sup>4</sup> Oekom Research. 2018. *Oekom Corporate Responsibility Review 2018: The Materiality and Impact of Sustainability Research*.

These networks include, at the international level, the World Business Council for Sustainable Development, the World Industry Council for the Environment, the Ceres Company Network, and the Global Reporting Initiative, and at the regional and national levels, the East Asian Seas Sustainable Business Network, the Confederation of Indian Industry, the China Business Council for Sustainable Development, and Philippine Business for the Environment. Many have established codes of conduct and responsible environmental management practices for firms. Some highly profitable companies are going further still by turning constraints into opportunities through innovation, embedding sustainability in their company cultures, and actively shaping their business environments. Such companies have been dubbed “new sustainability champions” by the World Economic Forum (WEF).<sup>5</sup>

However, despite significant progress, governments around the region face a multitude of more pressing priorities, lack sufficient resources to allocate toward green growth, and still experience weak implementation of existing policies. Generally, the electorate in this group of countries does not place high importance on conserving natural resources. In addition, local financing is scarce, accountability measures are lacking, and inadequate governance is still a frequent barrier.

In particular, greening is still not practiced by the majority of small and medium enterprises (SMEs), which dominate the corporate landscape across the region. Part of the reason is the lack of supply-chain pressures on SMEs in most Asian countries. For instance, in a number of Southeast Asian nations, SMEs’ participation in production networks (direct and indirect exporters) is quite low (30% or less).<sup>6</sup> From an environmental perspective, this low participation rate is significant, as SMEs account for a sizable amount of industrial pollution and waste generation. Although the volume of pollution generated by each firm may be limited, SMEs as a whole can do worse damage to the environment than larger multinationals.

To pursue green business innovation, governments must implement a cost-effective mix of policy instruments to achieve short-term “wins” and support long-term transformation in order to mobilize private investment and to enable structural and behavioral change among producers, traders, distributors, and consumers. The challenge is to design policies and regulations that are stringent enough to incentivize compliance and innovation, predictable enough to engender long-term investments, and flexible enough to adjust to changing circumstances, especially new technologies. Both economy-wide and sector-targeted policies are required to develop the inter-disciplinary and inter-sectoral approaches that are necessary to match the demand for appropriate innovations to the supply.

#### **IV. Policy Measures to Promote Green Business Development**

Governments should seek a mix of policy instruments that achieve short-term wins and long-term transformation. These can include economy-wide policies, such as support for green innovation and natural resource pricing, or policy measures in key sectors, such as transport and agriculture. Governments can consider four possible policy levers—regulations, market-based instruments, enabling investments, and business-oriented practices. It is also important to understand what types of companies that policy should be targeted at. In particular, policy makers must focus on assisting SMEs in making the necessary transformations in their business models.

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<sup>5</sup> World Economic Forum. 2011. *The New Sustainability Champions*. <http://reports.weforum.org/new-sustainability-champions/> (accessed 19 October 2018).

<sup>6</sup> G. Wignaraja. 2013. Can SMEs participate in global production networks? Evidence from ASEAN firms. In D. K. Elms and P. Low, eds. *Global Value Chains in a Changing World*. Geneva: World Trade Organization.



This paper proposes the following policy measures to help promote green business development in the region.

- **Green business approaches for natural capital.** Governments and development finance institutions (DFIs) can work together to make countries benefit from sound natural resource management. Natural capital accounting approaches enable governments and businesses to improve their decision making to include natural capital considerations. These approaches include the United Nations (UN) System of Environmental Economic Accounting, the World Bank's Wealth Accounting and the Valuation of Ecosystem Services, and the Natural Capital Protocol. Governments and DFIs can also support underserved but rapidly emerging nature-based business sectors that play a central role in green business transformation, including sustainable agriculture and food industry, forestry, and ecotourism. Finally, there are policy approaches that advance green business innovation while preserving natural capital. Notable examples are payments for ecosystem services (PES) and wetland mitigation banking.
- **Green technology innovation.** Green innovation policies and investments play a key role in supporting green business development. Governments can consider grants and direct investments for early market research and development (R&D). Existing national tax systems may be used to offer a combination of broad-based and sector-specific support for business R&D, which can be incremental in nature and also targeted at SMEs. Green business incubators and other similar venture support programs (including early-stage venture funding support) via government or multilateral agency interventions can also help smaller firms scale up their activities. Developing Asian countries may also look to incremental innovation or the adaptation of long-established clean technologies to local conditions through various technology transfer mechanisms, to unlock value at the base of the economic pyramid.
- **Private sector green finance.** Because of fiscal restraints in many countries, private finance will increasingly have to make up the bulk of green finance over the long term. Private capital expansion can be supported through public investments and institutions, such as central banks, DFIs, and institutional investors. DFIs can put forward financing instruments to make green businesses more profitable by helping them increase existing capital and create or further leverage an enabling environment for private investors. These approaches include: (i) green banking, which involves working with banks to incorporate environmental risk in their lending portfolios; (ii) green bonds, which are debt instruments for financing projects that deliver environmental benefits; and (iii) sustainable investing, whereby investors can incorporate environmental criteria in their decision making. In these programs, governments must devote significant efforts to building capacity and educating the public, including the management of private sector companies.<sup>7</sup>
- **Public funds and “blended finance.”** Governments can join private investors and international aid providers in providing “blended finance,” or public funds used to attract private capital toward investments delivering sustainable development impact, to support green businesses. Public investors can provide concessional finance, which is often at below-market rates, to leverage private capital toward green investments. In these efforts, public investors can identify or develop investment opportunities (typically by providing grant-based funding or technical assistance), while governments must prepare sizable green project pipelines through national development planning or appropriate financing facilities. Public investors can also offer products (such as risk guarantees) that help mitigate specific types of risk, including credit, political, and systemic risk. By reducing

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<sup>7</sup> D. Ponzi, J. Bowyer, and P. Tregidgo. 2018. Green Finance, Explained. *Development Asia*. April. <https://development.asia/explainer/green-finance-explained> (accessed 19 October 2018).

the real and perceived risks surrounding a given investment, such products can help boost private investor confidence, especially in relation to high-risk projects. Finally, by leveraging the experience and skills of private sector management, governments can also address their lack of human resource capacity to manage these investments (footnote 7).

- **Market-based approaches for green businesses.** Market-based policy instruments (MBIs) can provide an economically efficient approach to aligning economies toward environmental sustainability by “getting the prices right” so as to internalize environmental externalities.<sup>8</sup> MBIs can be either price-based (incorporating negative externalities of production or consumption activities through taxes or charges) or rights-based (controlling the quantity of the environmental good or service to a predetermined level). Well-designed MBIs can stimulate innovation by improving business performance and making firms more productive and profitable.<sup>9</sup> The type of market-based instrument and the way it is implemented can help entice firms to seek new opportunities and markets and to increase their competitiveness, rather than just focusing on avoiding problems and managing risks. Governments can consider rights-based instruments, such as emissions trading schemes, instead of price-based instruments, because the former can lead to higher profits and do not require firms to pay for the remaining pollution emitted, unlike taxes. To induce firms to accept and support MBIs more easily, governments can consider returning to the firms the pollution fees charged, as subsidies for abatement investments, and also allocating tradable permits free to firms rather than using auctions.<sup>10</sup> Overall, MBIs should supplement government regulations and be carefully tailored to local institutional capacity.<sup>11</sup>
- **Skills training for smooth transitions.** Governments and the private sector also need to focus on skills development policies. New green businesses can create jobs. Skills development policies can help avoid investment bottlenecks, increase employment opportunities, smooth the transition of workers from declining sectors, reduce social tensions and inequality, and support inclusive growth (footnote 8). Governments can improve training programs and certification schemes, together with industry skill councils or chambers of commerce. In addition, support programs can help SME management understand green practices and technologies better and overcome obstacles, such as limited access to finance and lack of awareness of those practices and technologies.
- **Informational approaches for green business.** Public disclosure programs, certification, eco-labeling, industry codes of conduct, and domestic voluntary agreements are valuable tools that are too often underused. Policy makers can leverage them to share some of the responsibility for environmental protection with investors, producers, distributors, consumers, and the general public. Public disclosure and green certificates can complete green finance by making it easier both for banks to evaluate the feasibility of such projects and for manufacturers and users of green technology to gain access to this finance. Governments, however, cannot view public disclosure and other business-led programs as a substitute for weak regulatory and civic society pressures. The way forward should be a blend of voluntary approaches, law enforcement, and MBIs, combined with the development of community, market, and civic pressures (footnote 11).

<sup>8</sup> S. Hallegatte, M. Fay, and A. Vogt-Schilb. 2013. *Green Industrial Policies: When and How (English)*. Washington, DC: World Bank; P. King, A. Olhoff, and K. Urama. 2014. Policy Design and Implementation. In *Green Growth in Practice: Lessons from Country Experiences*. Global Green Growth Initiative.

<sup>9</sup> M. E. Porter and C. Van Der Linde. 1995. Toward a New Conception of the Environment–Competitiveness Relationship. *The Journal of Economic Perspectives*. 9(4). pp. 97–118.

<sup>10</sup> W. Harrington and R. D. Morgenstern. 2004. *Economic Incentives versus Command and Control: What’s the best approach for solving environmental problems?* Resources. 15 February. pp. 13–17. <http://www.rff.org/research/publications/economic-incentives-versus-command-and-control-whats-best-approach-solving> (accessed 20 October 2018).

<sup>11</sup> D. Ponzi and J. Bowyer. 2018. How Can Policy Makers Promote Green Business? *Development Asia*. October. <https://development.asia/explainer/how-can-policy-makers-promote-green-business> (accessed 20 October 2018).

## V. Conclusions

The world is on the cusp of a technology disruption that may surpass the unprecedented growth of the telecommunications industry. The trends are now clear, and the core technological and economic drivers of the green growth are increasingly being recognized.

But while a wave of green technological advances is undeniably on the way, it is not certain how quickly developing Asian countries will adopt these technologies or, better yet, become innovators in their own right. The pace and extent of technology innovation, adaptation, and absorption in the region will largely inform to a large extent global resource demand and environmental quality.

The “green” response of developing Asian countries will also help determine the pace of economic growth in the region. Policy makers, along with business leaders, can either seize emerging opportunities or sit by and watch others profit. No small part of this challenge is accepting that the previous status quo is no longer the baseline. Those that embrace the inevitable green transformation will be rewarded.

The challenge is partly getting the right mix of policies and partly gaining access to capital. And here, it is clear that the innovations are not just technological. Some innovations can be financial; these include partnerships that spur increased private sector investments, or the creation of entirely new markets through PES schemes. Other innovations relate to business models, such as “base-of-pyramid” solutions to complex challenges.

It is important to remember that policy portfolios develop over decades. Therefore, policies in support of green business require a long-term consistent effort to strengthen institutional and governance capacity to manage, enforce, and monitor and evaluate policies.

With a solid foundation, new approaches can help address the long-standing challenge of decoupling economic growth from negative environmental impact and natural resource consumption. The growing momentum bodes well for the eventual achievement of the 2030 Agenda for Sustainable Development. There are tremendous opportunities ahead for those with the foresight to seize them.

## ABBREVIATIONS

ADB	Asian Development Bank
ASEAN	Association of Southeast Asian Nations
CCMT	climate change mitigation technology
DFI	development finance institution
EBI	Environmental Business Internationa
EGS	environmental goods and services
ESG	environment, social, and governance
EU	European Union
GBP	Green Bond Principles
GDP	gross domestic product
GEF	Global Environment Facility
GHG	greenhouse gas
ISO	International Organization for Standardization
MBI	market-based instrument
NGO	nongovernment organization
OECD	Organisation for Economic Co-operation and Development
PES	payments for ecosystem services
PRC	People's Republic of China
R&D	research and development
SDG	Sustainable Development Goal
SMEs	small and medium enterprises
UK	United Kingdom
UK DBIS	UK Department for Business, Innovation and Skills, now the Department for Business, Energy and Industrial Strategy
UN	United Nations
UNEP	United Nations Environment Programme
US	United States
USAID	United States Agency for International Development
WEF	World Economic Forum
WWF	World Wide Fund for Nature (formerly, the World Wildlife Fund)

# I. INTRODUCTION

1. As a result of strong economic growth in Asia and the Pacific, hundreds of millions of people have been lifted out of poverty, and the region is now home to a healthier, longer-living, and better-educated population. At the same time, however, many Asian countries have failed to grow in an environmentally sustainable way. As per capita incomes and consumption have risen, pollution levels have worsened, and natural resources have been depleted.

2. Economic activities put pressure on critical environmental assets to meet demand for hard and soft commodities, as well as on production systems that support global consumption patterns. Growing per capita incomes, population, and national wealth are major push factors, causing changes in environmental assets and their functions, including depletion of natural capital, loss of forests and biodiversity, decline in land productivity, air and water pollution, and water supply network losses (Panayotou 2016; WWF 2016; GFN 2018). Adverse spillover effects, or negative externalities, include pollution and waste. Appendix 1 gives additional details on the impact of economic activities on ecological assets.

3. The future of the global environment is near breaking point after four of nine “planetary boundaries”—including land use change, biosphere integrity, and climate change—were identified as being at high risk or increasing risk. Perhaps most dire in the near term is the loss of biodiversity, at a rate not seen in the past 65 million years. The main driver of this trend is rapidly increasing demand for food, water, and natural resources, leading to severe biodiversity loss and changes in ecosystem services (Rockström et al. 2009; Steffen et al. 2015). The ongoing loss and degradation of Asia’s natural capital is staggering.<sup>1</sup> There has also been a 60% decline in biodiversity in the region in the past 30 years, twice the global rate. About 25% of the total land area in the region is degraded, and 50% of dryland ecosystems are affected by desertification. Primary forests continue to shrink, even as forest restoration programs increase in places such as the People’s Republic of China (PRC) (WWF 2016; GFN 2018).

4. Environmental risks are widely recognized and are already affecting prospects for long-term growth and development. In fact, according to the latest Global Risks Perception Survey of the World Economic Forum (WEF), environment-related risks have consistently been among the top-five global risks in terms of perceived impact since 2011 (WEF 2018).

5. There is growing evidence that environmental risks affect human welfare. For instance, the World Health Organization (WHO) estimates that around 90% of the global population is exposed to unsafe levels of air pollution (WHO 2018). The global economic burden currently reaches a staggering \$5 trillion in welfare losses (World Bank 2016).

6. Amid all these serious environmental challenges, policy makers in the region are increasingly recognizing that economic growth, decent living standards, and environmental sustainability are interconnected. In many Asian countries, new legislation and initiatives are being put in place as part of a global push to make economic growth more environmentally sustainable, or greener. The “green growth” model of development seeks robust economic growth while also ensuring that natural assets continue to provide the resources and environmental services on which long-term well-being relies.

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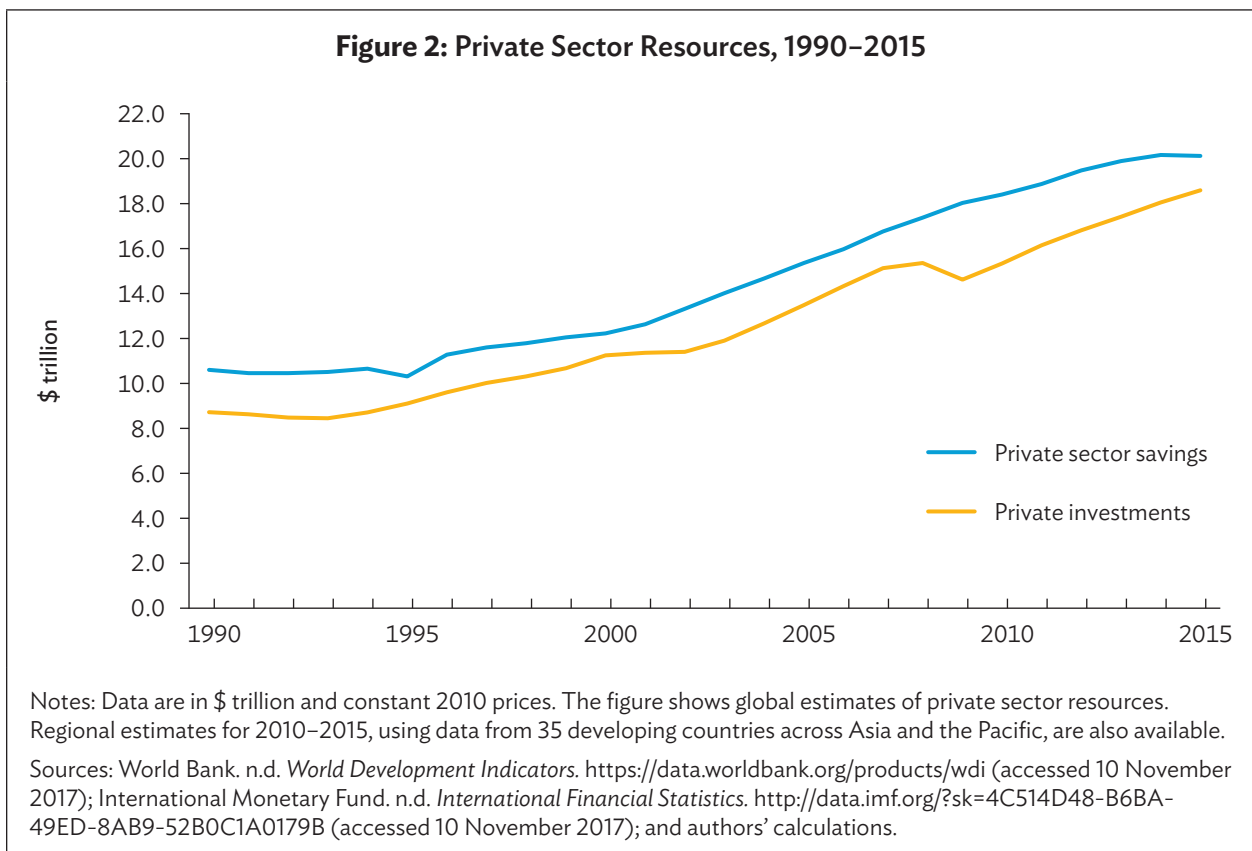
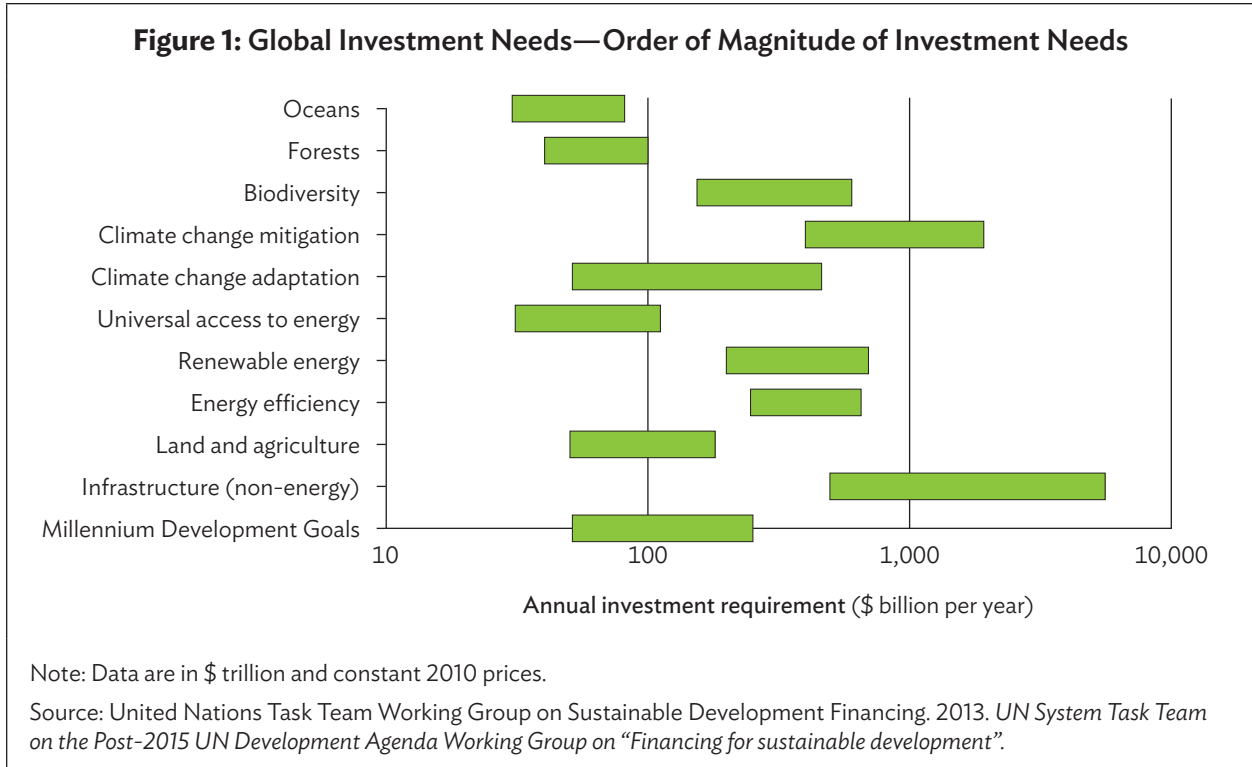
<sup>1</sup> Natural capital refers to the stock of ecosystems within a country. Natural capital covers renewable natural ecosystems and resources like forests, water and agricultural farmland, and nonrenewables like minerals and fossil fuels (ADB 2017b).

7. Governments are stepping in with policies and regulations to find cleaner ways of producing goods and services and to modify consumption patterns and behavior. These measures can be direct (command-and-control instruments such as input, output, and technology controls; emission licenses; and location controls) or indirect (market-based instruments, such as pollution, product, or use charges, taxes, and fees; resource management subsidies; deposit-refund systems; marketable permits; and trading schemes). In principle, the measures are aimed at restoring environmental functions or minimizing externalities. However, although regulations are in place, externalities are unlikely to be eliminated fully, often because environmental policy instruments are not well designed or implemented. Regulations are evolving; more flexible approaches—based on economic incentives—are increasingly being adopted, often in combination with other policy instruments. One clear benefit of flexible instruments is cost efficiency, as companies now have more options for abatement (e.g., adopting least-cost pollution technologies or paying pollution charges, taxes, and fees) instead of direct controls imposing prescriptive technology standards.

8. Environmental risks have made the task of public spending and domestic resource mobilization increasingly more challenging. The current financing landscape for environmental protection and management, dominated by public sector financing, is inadequate and unsustainable. This is particularly true of developing countries, which must balance a multitude of often-competing budget priorities with very limited resources. Figure 1 illustrates the annual global investment required for environmental protection and management, climate change mitigation and adaptation, development, and other key sectors of interest. Roughly \$0.35–\$1 trillion is needed annually for oceans, forests, biodiversity, and land and agriculture; of these environmental subsectors, biodiversity accounts for the lion's share of annual resource requirements (United Nations System Task Team Working Group on Sustainable Development Financing 2013). Developing Asia will need to invest \$26 trillion from 2016 to 2030, or \$1.7 trillion per year, in infrastructure, to maintain growth, eradicate poverty, and respond to climate change (ADB 2017a). The ASEAN countries alone will have to invest up to \$3 trillion over the period from 2016 to 2030 (UNEP and DBS 2017). Clearly, these needs cannot be met through business-as-usual approaches.

9. Since public sector funds and development assistance can supply only a small portion of green investments, the private sector needs to fill the financing gaps for green investments over the long term. Figure 2 shows the availability of private sector resources. Private sector savings worldwide in 2010–2015 amounted to about \$18–\$20 trillion a year; about half of this amount came from Asia and the Pacific (World Bank, n.d.; IMF, n.d.). This paper argues that private capital matters, and it is time to direct it to natural resource management, biodiversity conservation, and pollution control through green business. In the past, emerging debt capital markets provided hundreds of billions of dollars in much-needed financing for growth and development at scale to governments and corporations in formerly developing countries. Capital markets therefore have the potential to fill the huge need for environment and climate finance (Ponzi, Bowyer, and Tregidgo 2018).

10. The challenge for the public sector is to bring the private sector to the forefront of the green-growth transition. Inherent in this challenge is the need to engage firms in innovative ways to go beyond increasing wealth for their shareholders to achieving the twin goals of social development and environmental improvement. However, available capital from the private sector does not simply fall from the sky. As important as bridging the financing gap is demonstrating that mobilizing private resources in the environmental sector will guarantee long-term value creation for investors.



11. This paper is focused on green businesses dealing with natural resource management—including ecosystem services and biodiversity conservation, and pollution control and prevention—that are in the early stages of leveraging private sector capabilities and presence. It recognizes that clean energy and sustainable transport have already been mainstreamed to a good extent. The paper offers seven entry points for policy measures that governments and development finance institutions (DFIs) can adopt to accelerate green business development. The working paper aspires to be a starting point for further policy and research dialogue on green business development in the region. Section II reviews the nascent literature on green business, Section III presents opportunities to promote green business development through policy measures, and finally, Section IV offers conclusions. The appendixes contain supporting discussions corresponding to the four sections.



## II. A BRIEF REVIEW OF GREEN BUSINESS

### A. Why Green Business?

12. More than 500 international agreements on global environmental protection and management are currently in effect. Some examples worth noting are the Long-Range Transboundary Air Pollution (1979) and Biological Diversity (1992), the Montreal Protocol on Substances that Deplete the Ozone Layer (1987), and the more recent Paris Agreement on Climate Change (2015) under the United Nations (UN) Framework Convention on Climate Change (1992). These international agreements address key cross-border issues (air pollution, climate change, ocean pollution, ozone depletion), and require commitments from countries worldwide. National or country environmental policies tend to reflect key domestic measures, legislation, and programs that help achieve the conventions' agreements on important environmental issues and related key emerging challenges. Appendix 2 provides a list of international environmental agreements.

13. The past 2 decades have seen increased recognition of the centrality of economic growth and environmental protection—dubbed the “green growth” imperative, green economy, or environmentally sustainable growth—to development. High-income countries are leading the way in pursuing green-growth initiatives, while an increasing number of middle-income and low-income countries are challenging the “grow now, clean up later” approach and committing themselves to green growth. This momentum, along with the growing impetus for action, culminated in the adoption of the 2030 Agenda for Sustainable Development and the Addis Ababa Action Agenda. The 2030 Agenda for Sustainable Development has helped galvanize action around the 17 Sustainable Development Goals (SDGs) and their 169 targets. The SDGs comprise such environmentally related goals as providing clean water and sanitation, making cities more sustainable, addressing climate change, protecting marine and terrestrial ecosystems, and ensuring sustainable consumption and production patterns. Other notable milestones include the Sendai Framework for Disaster Risk Reduction 2015–2030 and the UN Framework Convention on Climate Change (UNFCCC) 21st Conference of Parties (COP21) climate conference in Paris, where 195 countries adopted the world’s first legally binding, comprehensive climate agreement.

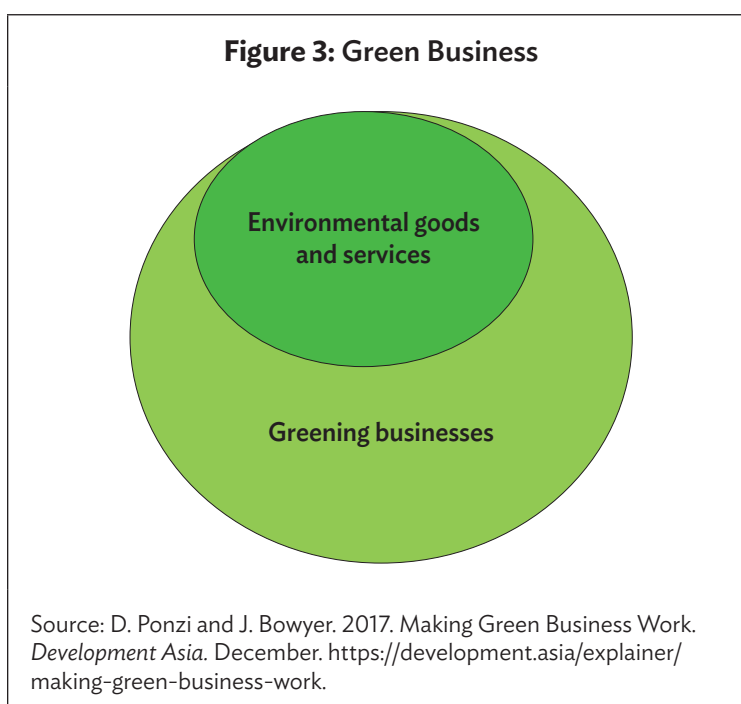
14. The 2030 Agenda for Sustainable Development, the Paris climate agreement, the Sendai Framework for Disaster Risk Reduction, and the Addis Ababa Action Agenda underscore three important opportunities to help build a solid case for green business development:

- (i) Aligning private investment with sustainable development, including environmentally related goals, along with public policies and regulatory frameworks to set the right incentives;
- (ii) Increasing collaborative efforts among communities, the public sector, and private sector entities; and
- (iii) Expanding the domestic resource base and mobilizing limited domestic financial resources for critical areas of development, including social protection and environmental sustainability.

15. Reflecting the traditional role of the public sector in environmental resource management, the last point mentioned suggests an increased need to look for steady and innovative streams of alternative sources of capital to manage the environment. This will help free up fiscal space, by shifting part of the burden of environmental management from the public sector to private capital.

16. While many industrialized economies have paved the way for green investments and innovations, developing countries face many pressing challenges and have limited resources. Commitments exist on paper and overall policies are in place, but supporting mechanisms and agreements for implementation are often slow-moving, missing, or ineffective.

17. In the absence of a universally accepted definition for “green business,” this paper offers a broad working definition: “any profit-oriented activity that supports environmentally sustainable growth” (Ponzi and Bowyer 2017). Figure 3 illustrates the spread of green business. The size of the circle conceptually represents the market size (e.g., the outer circle dominates the mainstream market).



18. The first category (inner circle) relates to environmental goods and services (EGS). These are private sector activities that “produce goods and services to measure, prevent, limit, minimize, or correct environmental damage to water, air and soil, as well as problems related to waste, noise and ecosystems” (OECD/Eurostat 1999). Included here are technologies, products, and services that reduce environmental risk, and minimize pollution and resource degradation. Some examples of business activities under this category include pollution control and equipment manufacturing, eco-labeling and green certification, wetland mitigation banking, biodiversity or conservation banking, ecotourism, and eco-friendly products. EGS green businesses serve firms that fall within the outer circle, so they overlap and coexist.

19. The second category is made up of greening businesses (outer circle)—private sector firms taking active steps to change their products or processes to promote environmental sustainability. These measures can be taken at various points in the life cycle of a product and extend throughout

the entire supply chain of a good or service. Firms can integrate “greenness” into their business in different capacities and to differing degrees, from introducing new inputs to transforming production and consumption patterns across entire value chains. Green businesses of this nature are usually seen in pollution- and resource-intensive industries, such as food, beverages, textiles, and soft commodities.

20. Studies point out that green businesses in the second category benefit from the relationship between regulatory and external pressures (coming from communities, media, global supply chain partners, and competitors) and a firm’s environmental performance (Kassinis and Vafeas 2006; Foerstl et al. 2010; Fitjar 2011; Diabat and Govindan 2011; Wu 2014). Firms also tend to take such pressures into account when developing their operational policies pertaining to resource use efficiency (e.g., reducing water and energy consumption, pollution emission, and waste reduction) or when self-regulating at times to minimize reputational risk. A green business in this group would consider itself as having environmental goals, but would be committed to those goals because of the prospect of enhanced shareholder value. Appendix 3 discusses in detail the regulatory and external pressures behind improvements in environmental performance.

21. Green business development involves many actors (GEF 2017). The companies themselves vary from large corporations to small and medium enterprises (SMEs); they provide ideas, technical expertise, capital goods, and labor. For their part, governments are expected to set policies and introduce regulations to get the prices right and promote a level playing field through such means as the removal of distorting subsidies. To address negative externalities, they also often use market-based instruments, such as environmental taxes and other resource use charges. They can likewise play a direct financing role by offering subsidies, or an indirect financing role through indirect subsidies (such as infrastructure provision) or tax incentives.

22. With the rise of green financial instruments (e.g., green loans, climate bonds, impact investments), two other groups of private sector actors are playing a more central role in green business development. In the first group are capital providers, including pension funds, insurance companies, commercial trusts, and endowment funds. The second group comprises financial intermediaries (e.g., commercial banks, investment banks, investment management firms, and private equity firms). Capital providers can use these entities as middlemen, linking capital to investment opportunities, such as green projects, and having the main function of appraising risks and returns (Ponzi, Bowyer, and Tregidgo 2018).

23. Multilateral development banks (MDBs) like the Asian Development Bank (ADB), on the other hand, provide funds using their own capital or acting on behalf of several government donors, and also through their own dedicated funds. MDBs work with and through international environmental finance mechanisms and funds, such as the Global Environment Facility (GEF) and the Green Climate Fund (GCF). Meanwhile, bilateral DFIs and dedicated environmental finance funds typically extend finance from one developed country to several developing countries. These organizations account for the largest share of public finance flowing from developed to developing countries for environmental finance purposes.

24. In addition, domestic organizations, including national development banks, government agencies, and nationally sponsored climate funds, play an increasingly critical role as intermediaries and providers of environmental finance within their respective countries. This is particularly true of emerging markets like the PRC and India (Ponzi, Bowyer, and Tregidgo 2018).

## B. Overview of Green Business

### 1. Category 1: Environmental goods and services

25. The traditional and long-established market for environmental goods and services includes: air pollution control; water pollution control and wastewater treatment; waste management; monitoring instruments, and electronic and information technology equipment; environmental consulting; and renewable energy and energy efficiency. A number of other green business sectors fall outside the traditional environmental goods and services. Many of these areas are still underserved but rapidly emerging, like sustainable agriculture, fisheries, forestry, and ecotourism.

26. EGS green businesses are worth between \$1.107 trillion and \$5.56 trillion on a global scale, and range between \$0.898 trillion and \$1.169 trillion without the energy-related segments (Table 1). Regional estimates for Asia are between \$0.247 trillion and \$2.067 trillion, and between \$0.20 trillion and \$0.99 trillion without energy.

**Table 1: Environmental Goods and Services Market (\$ trillion)**

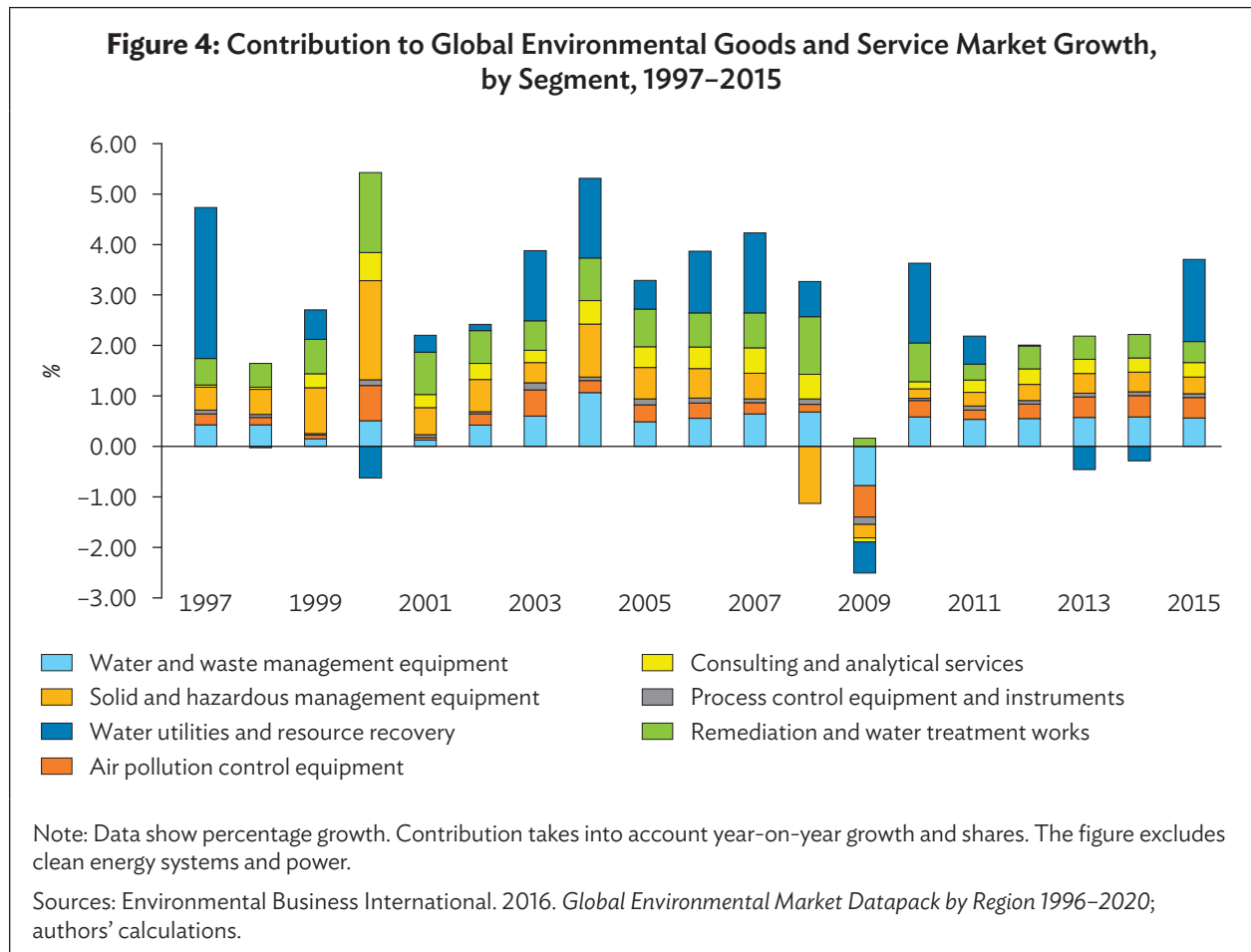
Year	Environmental Business International (EBI)			Department for Business, Innovation and Skills (DBIS), UK		
	Global	Asia	% (Asia/Global)	Global	Asia	% (Asia/Global)
2009	0.884 (0.775)	0.182 (0.150)	20.59 (19.35)	4.958 (1.059)	...	...
2010	0.925 (0.803)	0.197 (0.162)	21.30 (20.17)	5.076 (1.079)	1.882 (0.902)	37.1 (83.6)
2011	0.965 (0.820)	0.205 (0.168)	21.24 (20.49)	5.464 (1.156)	2.023 (0.969)	37.0 (83.8)
2012	1.002 (0.836)	0.214 (0.176)	21.36 (21.05)	5.560 (1.169)	2.067 (0.990)	37.2 (84.7)
2013	1.031 (0.850)	0.224 (0.183)	21.73 (21.53)	...	...	...
2014	1.065 (0.867)	0.235 (0.193)	22.07 (22.26)	...	...	...
2015	1.107 (0.898)	0.247 (0.202)	22.31 (22.49)	...	...	...

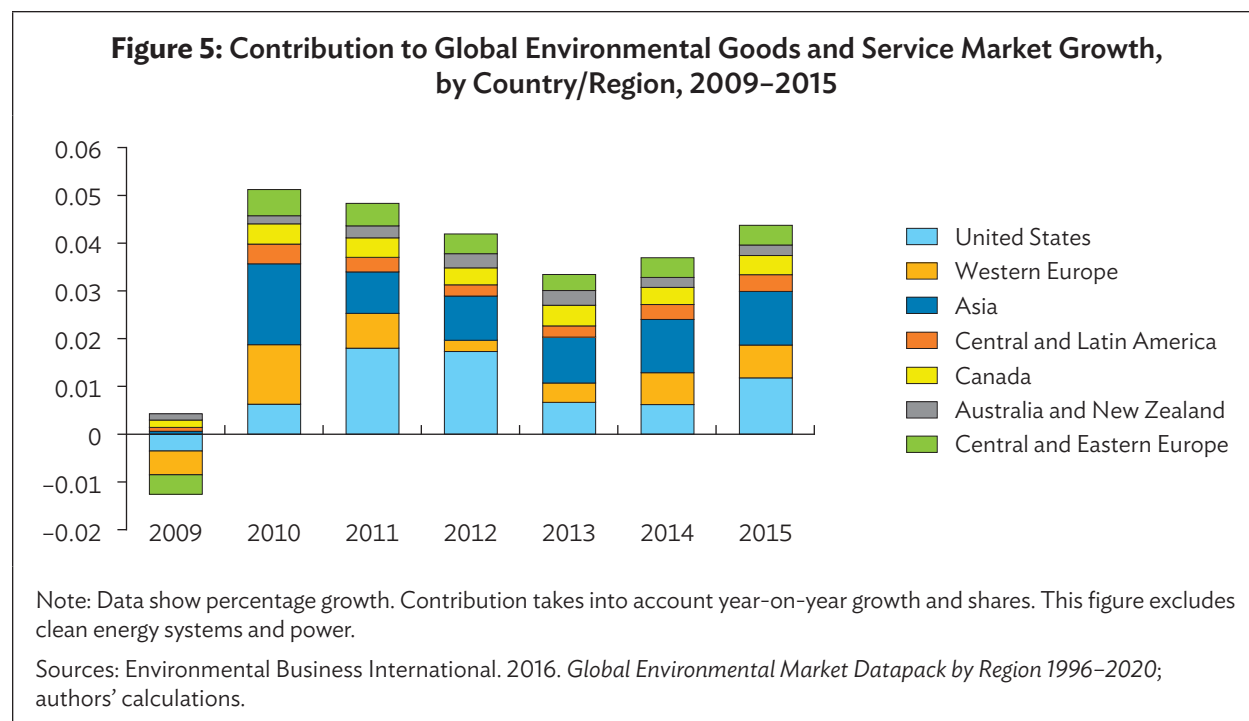
Notes: The estimates reported represent aggregate values for all business sectors including services, equipment, and resources. Estimates in parentheses are net of energy-related segments; this means that values for clean energy power and systems were netted out of aggregate estimates. This same approach was used in estimating the EGS market on the basis of DBIS data. For EBI datasets, 9.4% (the EGS market share of energy-related segments in 2012) was used in estimating Asian EGS markets, net of energy-related segments, for 2009–2015. For data obtained from the UK DBIS, estimates were annualized to be comparable with EBI estimates; the original estimates were for fiscal years. Estimates from both sources included those for Japan and the Pacific subregion. The ellipses indicate that no data were reported.

Sources: Environmental Business International. 2016. *Global Environmental Market Datapack by Region 1996–2020*; UK Department for Business, Innovation, and Skills. 2013. *Low carbon and environmental goods and services: 2011 to 2012*. <https://www.gov.uk/government/publications/low-carbon-and-environmental-goods-and-services-2011-to-2012>; and authors' calculations.

27. Estimates of the trend in green businesses within the EGS market vary widely. Lower-bound estimates reflect data gathered by Environmental Business International (EBI); ceiling estimates are from the former UK Department for Business, Innovation and Skills (DBIS, now the Department for Business, Energy and Industrial Strategy). Appendix 4 describes each data set in more detail. Two points can be made about the trend in green businesses within the EGS market:

- (i) The market is growing both globally and regionally. For example, global green business is estimated to have grown by 25% between 2009 and 2015, according to EBI data, and by about 12% between 2009 and 2012, according to UK DBIS data. The Asia and Pacific region posted growth of over 35% between 2009 and 2015, according to EBI data, and 10% growth between 2009 and 2012, according to UK DBIS data. Equipment for water and wastewater remediation and air pollution control, and remediation services and wastewater treatment were the EGS components that contributed the most to global EGS market growth from 1997 to 2015 (Figure 4).
- (ii) Asia has a substantial share of this market (ranging from 22% to 84%) and contributes significantly to driving the global EGS market (Figure 5).





28. Within Asia, the PRC has the largest market share. This is to be expected, given the large size of its economy, but it also reflects a big push by the PRC to develop green industries. Driven by ambitious targets to improve energy efficiency, the PRC has been making significant progress in a number of areas, including clean energy, alternative energy, and green buildings. Twenty-seven of the 48 top green technology companies in the world are Chinese (Chandran 2015). In particular, the PRC is the leading global producer of solar photovoltaic modules. As the PRC's market for environmental goods and services continues to grow, other environmental sectors in need of attention and with the biggest growth potential have emerged. Estimates projected that the market for environmental management would grow to around \$1.1 trillion by 2020. However, as of 2015, the ratio of PRC environmental investment to gross domestic product (GDP) was 1.5%, lower than that for developed economies. To meet its environmental challenges, the PRC will have to ramp up its investments in sectors such as soil remediation, solid waste treatment, and water treatment, besides increasing its investments in air quality monitoring technology, emission reduction, and carbon trading (Zhu et al. 2015).

29. To estimate green economic potential by country, a recent ADB working paper analyzed two indicators, one for innovation specialization and the other for comparative advantage.<sup>2</sup> For both indicators, the paper concluded that in general Asia is strong in climate change mitigation technologies (CCMTs), mainly in the energy sector. By specific technology sector, the region's core strength is in efficient lighting, photovoltaics, and energy storage, where it has both an innovation and export specialization (Fankhauser, Kazaglis, and Srivastav 2017). These strengths come amid huge increases in renewable energy investments regionwide (Box 1).

<sup>2</sup> The first indicator, the green innovation index (GII), is a measure of innovation specialization. The GII employs patent data to indicate whether a country "specializes" in innovating a technology. The second indicator measures comparative advantage, using a standard Balassa index of revealed comparative advantage (RCA). The Balassa index employs trade data to assess whether economies have a current specialization in low-carbon technologies.

### **Box 1: Asia Leading the Way in Renewable Energy Investments**

Led by Asia and by the People's Republic of China (PRC) in particular, 2015 was the first year in which investments in renewables (excluding large hydroelectric projects) in developing countries outweighed the total for developed economies. The PRC increased its investment by 17%, to \$102.9 billion, or 36% of the world total, while India's rose 22%, to \$10.2 billion. Meanwhile, Pakistan and the Philippines joined the group of developing countries investing more than \$500 million.

Globally, the amount of money committed to renewables (excluding large hydro) in 2015 rose to a new record of \$285.9 billion. In terms of capacity added, commissioned renewable energy projects totaled 134 gigawatts, 53.6% of all power generation capacity completed—the first time such projects made up a majority. New projects are dominated by wind and solar, with the smaller sectors (biomass and waste-to-energy, small hydro, geothermal, biofuels, marine) losing relative importance.

The biggest components of investment in 2015 were asset finance of utility-scale projects, such as wind farms and solar parks, at \$199 billion, and spending on small distributed capacity (mainly local and rooftop solar projects with a capacity of less than 1 megawatt capacity), reaching \$67.4 billion.

In terms of the levelized cost of electricity (LCOE), the spectacular mover has been solar photovoltaics, the single biggest subsector in renewables. The average global levelized cost for crystalline-silicon photovoltaic has plummeted from \$315 per megawatt-hour (MWh) in Q3 2009 to \$122 in late 2015—a drop of 61%, reflecting deflation in module prices, balance-of-plant costs, and installation expenses.

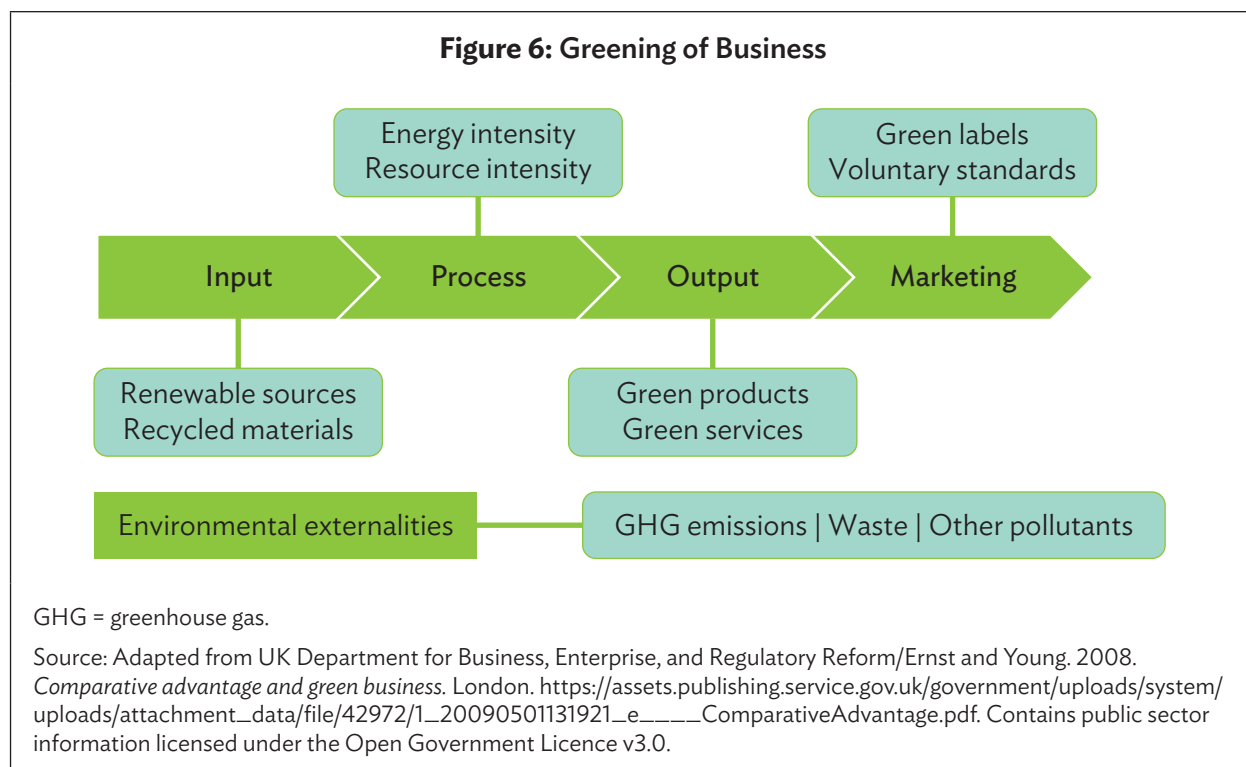
A number of projects, including several resulting from auctions in India in late 2015 and early 2016, are coming in at much lower figures. Indian solar projects won capacity with bids of \$64 per MWh (Fortum Finnsuurya Energy in Rajasthan) and \$68 (SunEdison and Softbank in Andhra Pradesh).

Source: Frankfurt School–UNEP Centre/BNEF. 2016. *Global Trends in Renewable Energy Investment 2016*.

30. The PRC, Japan, and the Republic of Korea are key CCMT exporters and innovators, and account for a large share of Asia's export and high-value patenting activity. This is a strong indicator of the region's potential, as more innovative economies are likely to be better placed to capture markets in new "frontier" technologies. However, Asia's position as an exporter of CCMTs is stronger overall than its position as an innovator. Clean technology patents across developing countries outside the PRC are still few and far between.

## **2. Category 2: Greening businesses**

31. In addition to the growing number of firms supplying green goods and services, many more companies are "greening" their businesses. Green business model innovation occurs when "a business changes part(s) of its business model and thereby both captures economic value and reduces the ecological footprint in a life-cycle perspective" (Bisgaard, Henriksen, and Bjerre 2012). Such innovation need not be perceived as a one-time change, but rather should be thought of as a continuous process of efficiency enhancement and productivity improvement.



32. Firms can integrate green approaches into their business in different capacities and to differing degrees. Some are using greener inputs or selling more environmentally sustainable products and services, while others are transforming production and consumption patterns across entire value chains.<sup>3</sup> As shown in Figure 6, companies can take action at any of the five steps in the life cycle of a business: input, process, output, environmental externalities, and marketing (Ernst & Young and BERR). For example:

- (i) Inputs may be discarded or recycled output from other firms that has not necessarily been produced in a green way.
- (ii) Lowering input resource intensity at the processing stage can make products and services greener.
- (iii) Companies can make their outputs more environmentally friendly, either directly (for example, by making their products biodegradable) or indirectly (by using more eco-friendly packaging).
- (iv) At the marketing stage, green certification and voluntary standardization can improve the reputation of a firm.
- (v) Through improvements in the foregoing stages, companies can reduce environmental externalities, such as waste, emissions, and other pollutants.

<sup>3</sup> A value chain encompasses the full range of activities through which goods or services pass, including design, production, marketing, distribution, and support for the final consumer. All these activities can be carried out by a single firm or divided among different enterprises. They can also be done within a single geographic location or spread over a wider area, as is the case with global value chains (Frederick 2016).



33. Practices such as green supply chain management and green procurement focus on greening the upstream segment of a value chain, while increased responsibility and product stewardship taken on by producers is geared toward greening downstream functions.<sup>4</sup>

34. In these efforts, a life-cycle assessment (LCA) can be done to take stock of the environmental impact associated with all stages of the product life cycle, from raw-material extraction, through processing, distribution, use, and maintenance, and up to disposal or recycling. An LCA can also enable more informed and holistic business decision making. Restructuring the process to achieve circularity is an innovative measure, as waste is now treated as a resource and products are now sold and designed with future restoration in mind.

35. At the furthest point are closed-loop systems, where materials and resources are recycled endlessly, and waste and pollution do not exist. The “circular economy” concept involves a fundamental rethinking of products, materials, and whole systems. While this vision is still a long way from reality on a macro scale, industrial symbiosis is already happening. This entails sharing resources and by-products among industrial actors on a commercial basis through interfirm recycling linkages.

36. One reasonable approach to estimating the market size of “greening businesses” is to look into aggregate EGS market values. The reason for this is simple: since the EGS market provides the goods and services necessary for businesses to adopt green practices in their operations or supply chain initiatives, in principle, it will reflect the investment costs and decisions made by businesses. These estimates (net of energy-related segments) are between \$0.898 trillion and \$1.169 trillion on a global scale, and between \$0.202 trillion and \$0.99 trillion for the region (see Table 1). In practical terms, these numbers suggest that although firms were driven initially by regulatory and external pressures, they are turning environmental awareness into a source of competitive advantage, indicating further that improving a firm’s environmental performance can translate into corporate financial rewards (Clark, Feiner, and Viehs 2015).

37. This paper describes this market by broadly documenting recent efforts of selected companies. Appendix 5 reviews recent efforts of selected high-performance companies that have greened their operations. The review points to the following:

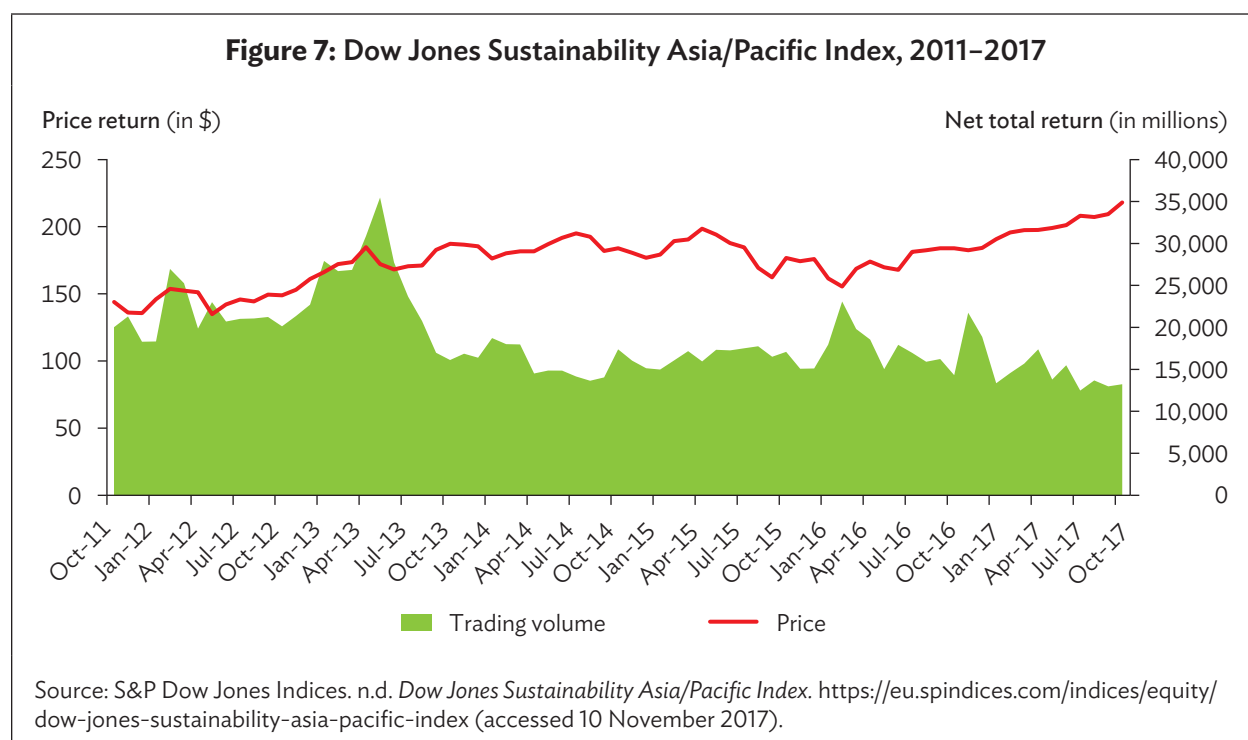
- (i) Investment options range from low-hanging fruit (e.g., general waste recycling and disposal) to double-dividend strategies, particularly in terms of cost savings and efficiency, such as water recycling and reuse, material recovery, pollution control, and resource conservation.
- (ii) Soft infrastructure investments—primarily in education and training for the development of skills for green jobs—help improve the knowledge base in different types of work settings. For example, Danone has set up an endowment fund to support employment, skills and employability, and micro-entrepreneurship programs for local partners and communities.
- (iii) Beyond compliance and profit, continuous innovation and research and development (R&D) help minimize the potential risks to long-term value creation and identify similar or related opportunities.

<sup>4</sup> Extended producer responsibility (EPR) is a strategy for incentivizing producers to improve their environmental performance by holding them responsible for the environmental impact of their products over a full life cycle.

## C. Current Progress

38. Despite the clear business case for going green, the private sector still has a long way to go before it can attain global sustainability targets. Results of recent corporate responsibility reviews by Oekom Research, a leading rating agency in the field of sustainable investment, show a mixed picture. On the one hand, in its analysis and rating of 3,800 companies, Oekom noted an upward trend in the average performance scores of companies in both developed and emerging economies from 2013 to 2017. In 2017, about 17% of rated companies were assessed as “very good” or “good” in terms of sustainability performance—a record high for the Oekom review series. In addition, about 44% of rated companies achieved medium-level performance scores, up from 35% in 2015 and 40% in 2016. Firms with low performance scores made up about 39% of rated companies—the lowest share in the history of the annual review. On the other hand, 36% of companies analyzed using Oekom’s Sustainability Solutions Assessment methodology were contributing to the achievement of the SDGs with their products and services. Oekom highlighted the environmental impact of the food and beverage industry: especially through its supply chains, the industry is a central contributor to climate change, resource scarcity, and loss of biodiversity. Oil and gas companies were also identified as poor environmental performers, as most operators still fail to address adequately the required reduction in their operational greenhouse gas emissions or to establish renewable energy divisions (Oekom Research 2018).

39. Asian companies and investors now recognize the business value of their sustainability initiatives better. According to the GreenBiz 2018 State of Green Business Report, stock exchanges in Asian countries such as Singapore and Malaysia are among the most proactive and transparent regarding environmental, social, and governance (ESG) risks (GreenBiz 2018). Corroborating this sentiment is a good return profile for the leading 20% among the top 600 companies in the region, according to monthly data over the 6-year period from 2011 to 2017, in the Dow Jones Sustainability Asia/Pacific Index (Figure 7).



40. Some green businesses of this type in the region are the Zhangzidao Fishery Group in the PRC; MTR Corporation in Hong Kong, China; Shree Cement and Jain Irrigation Systems in India; and Manila Water Company in the Philippines (WEF 2011). These and other highly profitable companies are going further by turning constraints into opportunities through innovation, embedding sustainability in their company cultures, and actively reshaping their business environments. These companies have adopted green practices in a variety of ways: conserving resources, educating consumers and providing them with appropriate financing, integrating sustainability into their operations, influencing policies and standards, partnering to achieve mutual goals, and building awareness. Additionally, more firms are adopting environmental management systems, seeking certification for their environmental practices from third-party organizations such as the International Organization for Standardization (ISO), and participating in global green business networks with established codes of conduct and responsible environmental management practices for firms. The networks include the World Business Council for Sustainable Development (WBCSD), the Ceres Company Network, the World Industry Council for the Environment (WICE), and the Global Reporting Initiative, or their regional and country counterparts, such as the East Asian Seas Sustainable Business Network, the Confederation of Indian Industry, the China Business Council for Sustainable Development, and the Philippine Business for the Environment. The PRC and several Southeast Asian countries lead in the number of ISO-certified firms worldwide.

41. In Asia, greening is still not practiced by the majority of SMEs, which dominate the corporate landscape. A recent study revealed that SMEs account for 97% of employment in Indonesia, 80% in the PRC, 78% in Thailand, 77% in Viet Nam, 61% in the Philippines, and 59% in Malaysia. Their contribution to GDP output is just as significant, at more than 50% of output in the PRC and Indonesia, and between 40% and 60% in Malaysia, the Philippines, Thailand, and Viet Nam (Wignaraja and Jinjarak 2015).

42. Part of the reason for the slow uptake of greening practices is the lack of supply chain pressures on most SMEs. In the PRC, such pressure is significant: SME participation in production networks (direct and indirect exporters) is 60%. However, as shown in Table 2, this share is much lower in Southeast Asia, and most SMEs in the region therefore face no external pressure to green their operations (Wignaraja 2013). From an environmental perspective, this lack of supply chain pressure is significant, as SMEs account for a sizable amount of industrial pollution and waste generation. Although each individual firm may be polluting only slightly, in aggregate, SMEs can do worse damage to the environment than larger multinationals. As explained in Box 2, without external pressures, the SME transition to more sustainable pathways is a difficult challenge.

**Table 2: Role of Southeast Asian SMEs and Large Firms in Production Networks**

	All Countries	Indonesia	Malaysia	Philippines	Thailand	Viet Nam
Number of firms in PN	2,203	206	646	352	619	380
PN firms as a percentage of all firms	37.3	14.5	59.7	26.9	59.3	36.4
SMEs in PN as a percentage of all SMEs	22.0	6.3	46.2	20.1	29.6	21.4
Large firms in PN as a percentage of all large firms	72.1	52.0	82.4	51.1	91.1	64.6

PN = production network, SMEs = small and medium enterprises.

Source: G. Wignaraja. 2013. Can SMEs participate in global production networks? Evidence from ASEAN firms. In D. K. Elms and P. Low, eds. *Global Value Chains in a Changing World*. Geneva: World Trade Organization.

### **Box 2: Challenges Faced by Small and Medium Enterprises in Asia and the Pacific**

In countries with low supply chain pressures and weak regulatory regimes, small and medium enterprises (SMEs) do not have strong incentives to innovate in a green direction. Conversely, they face a number of considerable constraints:

- (i) Many SMEs lack knowledge and skills related to greener practices at every level of the value chain. For example, in the development or production phase, SMEs are largely unaware of the composition of the materials used, the alternative materials that could be used, and the benefits and challenges of adopting one or discarding the other.
- (ii) Even if an SME is aware of possible measures, innovative pursuits pose a relatively higher opportunity cost, given the SME's lower margins. Many small firms operate in very competitive and low-margin industries. As a result, they are hesitant to invest in relatively unproven technologies or processes when the payback period is often uncertain. Indeed, there can be large costs associated with new machinery and new materials or changes implemented in new product development and design.
- (iii) A great number of SMEs simply do not believe that becoming greener is worth the effort. Half of small businesses think that green capital investment is too expensive and less than a quarter (22%) think that those investments will pay off. A study of the electrical manufacturing industry in Thailand noted that a lack of consumer demand for green products explained the low adoption rate of greener methods among many companies.
- (iv) SMEs in Asia face particularly high barriers to finance. Underwriting standards are stricter because SMEs may not have steady income or a favorable record of business performance. As a result, SMEs in developing Asian countries tend to depend more on internal finance and collateral for start-ups and business expansion, adding further to firms' risk aversion.

Source: C. Harvie, D. Narjoko, and S. Oum. 2013. *Small and Medium Enterprises' access to finance: evidence from selected Asian economies*. <http://www.eria.org/ERIA-DP-2013-23.pdf>.

## **D. Policy Measures for Promoting Green Business Development**

43. In pursuing green business innovation, governments must implement a mix of measures to achieve short-term wins and support long-term transformation to mobilize private investment, as well as enable structural and behavioral change among producers and consumers.

44. The rationale for policy intervention lies in market failures related to negative environmental externalities, which in turn lead to underinvestment in green innovation. Interventions must also address systemic failures, such as unclear goals, lack of accountability, and poor communication and coordination between the public and private sectors. These can also hinder the flow of technology and knowledge, thereby reducing the efficiency of green business innovation efforts (OECD 2012).

45. The challenge is to design policies and regulations that are stringent enough to encourage compliance and innovation, predictable enough to engender long-term investments, and flexible enough to adjust to changing circumstances, especially new technologies. Developing the inter-disciplinary and inter-sectoral approaches needed to supply appropriate innovations that will match demand requires both economy-wide and sector-targeted policies (Ponzi and Bowyer 2018).

46. It is also important to understand what types of companies should be the target of the policies. In Asia and elsewhere, companies that have taken on green business innovation are mainly large firms. While there are innovative small companies, policy makers must still focus on assisting SMEs in transforming their business models (Ponzi and Bowyer 2018).

47. This section explores a number of policy measures (especially those that go beyond the usual legal and regulatory framework) that governments, along with DFIs like ADB, can consider to help advance green business development.

### III. GREEN BUSINESS APPROACHES FOR NATURAL CAPITAL

48. Asia continues to degrade its natural capital at a rapid rate. While efforts to preserve natural assets must form a central part of economic development, businesses must also do their part. This paper identifies three ways that governments and DFIs can work together to benefit jointly from natural capital, but in a sustainable way.

#### A. Natural Capital Accounting

49. This approach enables governments and businesses to take natural capital into account in their decision making. Governments can do this through national-level accounting initiatives such as the UN System of Environmental–Economic Accounting or the World Bank’s Wealth Accounting and the Valuation of Ecosystem Services (WAVES). For companies, the Natural Capital Protocol is a standardized framework for identifying, measuring, and valuing corporate impact and dependence on natural capital (Natural Capital Coalition, n.d.). The framework covers four stages—why, what, how, and what next—and consists of nine steps. It was developed jointly by the World Business Council for Sustainable Development (WBCSD) and the International Union for Conservation of Nature (IUCN) as a pilot project, initially targeted at 50 businesses (Natural Capital Coalition, n.d.).

#### B. Support for Emerging Business Sectors

50. Governments and DFIs can also support underserved but rapidly emerging nature-based business sectors with a central role in green business transformation. These include the following:

- (i) **Sustainable agriculture and food industry.** The global market for organic food and beverages reached \$105 billion in 2015, compared with \$62 billion in 2011—a 67% increase (Research Institute of Organic Agriculture and IFOAM–Organics International 2017).
- (ii) **Forestry.** In 2013, certified forests covered a total area of close to 400 million hectares worldwide—about 10% of global forest resources (FAO 2016).
- (iii) **Ecotourism.** According to the Rainforest Alliance (2017), nature-based tourism accounts for 20% of international travel and continues to grow.

51. Globally, tourism generated \$7.6 trillion in 2016, or 10.2% of global GDP (WTTC 2017). Tourism has also become a significant contributor to national GDP in the region. It currently accounts for 2.7% of regional GDP and now supports 65 million jobs. The job total is expected to rise to 200 million by 2025. Long-term forecasts suggest that Asian tourism growth will average about 5% per year, outpacing global averages, and international visitor arrivals will exceed 535 million by 2030 (UNWTO 2015).

52. However, this growth will not come without negative impact, particularly at mass tourism destinations. Tourism without proper management controls can lead to resource degradation and a subsequent collapse in tourism growth and its associated benefits. There is a need and massive potential for investments in sustainable tourism, with the goal of improving the use of environmental resources for tourism development, respecting the sociocultural authenticity of host communities, and ensuring viable and long-term economic operations and socioeconomic benefits to all stakeholders (UNEP and UNWTO 2005).

53. This paper is focused on low-volume, high-value ecotourism, which is gaining prominence across Asia. Fortunately, ecotourism allows countries to reap the positive economic and social benefits of tourism, while also protecting the environment, along with heritage and cultural values. When managed properly, ecotourism underpins economic diversification and raises public revenue for landscape management and preservation of cultural assets. It can also stimulate creative industries, which form part of a destination's distinct and competitive identity.

54. Like any other environmental good or service, ecotourism can be subject to "greenwashing." This comes in the form of mass ecotourism, which shares many, if not all, of the attributes of conventional tourism but simply takes place in natural areas. In these cases, the developments that are being established to entice visitors can end up causing damage to the very natural resources the visitors are coming to see.

55. To ensure that ecotourism is truly sustainable, low-volume, high-value enterprises that can contribute to improved stewardship over terrestrial, marine, and coastal ecosystems, while supporting local livelihoods and resilience, can be promoted (see Box 3).<sup>5</sup> Such efforts enhance understanding of the importance of government and private sector investment in protecting natural capital.

### **Box 3: Nature-Based Tourism in the Coral Triangle Region**

A World Wide Fund for Nature (WWF)–commissioned baseline assessment by 2iis Consulting projected opportunities for nature-based tourism in the Coral Triangle region. Findings included the following:

- (i) Nature-based tourism, the fastest-growing tourism segment globally, has inherently higher value per visitor than other forms of tourism, and is notably more resilient to the periodic downturns that affect tourism for economic, societal, health, or environmental reasons.
- (ii) Ecotourism has a much lower overall adverse impact on the communities and environments of host countries, and real potential to help accelerate a country's development path over a sustained period of time.
- (iii) The estimated current size of the market indicates that ecotourism is a thriving tourism sector, although the exact numbers should be viewed with caution because of the current lack of segmented global data.
- (iv) The ecotourism market in the Coral Triangle ranges between \$19.7 billion and \$24.6 billion—equivalent to Malaysia's total domestic and international tourism industry.
- (v) By 2035, the ecotourism market could reach \$204.4 billion—twice the size of all the Coral Triangle countries' total tourism markets combined.

Source: 2iis Consulting. 2015. *Nature-Based Marine Tourism in the Coral Triangle: Exploring the potential for low-impact, high-value Nature-based Marine and Coastal Tourism*. <https://www.2iis.com.au/wwfcoraltrianglebaselineanalysis>.

<sup>5</sup> A range of nature-based approaches to enhancing resilience has emerged from several disciplines (Ponzi, Lu, and Rodgers 2017). Ecotourism is one emerging area where nature-based approaches can be applied to enhance resilience while making livelihoods more sustainable.

## C. Policy Approaches That Preserve Natural Capital

56. A third strategy would be for governments and DFIs to support policy approaches that advance green business innovation, while preserving natural capital. One such approach is payments for ecosystem services (PES), which rewards businesses and communities for good environmental practices. This approach often involves farmers, who receive payments for conserving or even improving the function of their lands for services as varied as watershed protection, carbon sequestration, and biodiversity conservation.

57. PES represents a change in thinking about the environment, and how to work with industries to protect and restore it. According to a recent study, ecosystem services for terrestrial ecosystems in Asia provide \$14 trillion in annual benefits, but these benefits are not captured by markets and do not show up in GDP (Kubiszewski et al. 2016). PES schemes are aimed at creating markets to help capture these benefits. Additionally, corporate social responsibility requirements may drive companies to implement PES programs in Asia (The Star Online 2007; CSR Asia 2015). Box 4 presents examples of PES programs.

58. The challenge is to scale up current efforts to greatly expand markets for ecosystem goods and services. In many developing Asian countries, PES pilot initiatives work through a “learning by doing” approach, supported by multidisciplinary and participatory engagement. Dedicated policies are required to maintain these PES programs beyond the pilot phase. Other factors, such as limitations in accounting for natural capital values and in rights-based approaches to ecosystem services, also add to the challenges involved in scaling up PES schemes in the region. Putting a price on nature does not always reflect the full range of values that ecosystem services bring, including intangible and nonhuman services (Timperley 2016). There are also social risks associated with implementing PES programs in the absence of property and customary tenure rights, particularly for vulnerable groups such as indigenous communities, whose livelihoods rely on ecosystem services and may be compromised by competing with would-be developers (Richards and Jenkins 2007; George et al. 2009). In this view, PES can be considered part of a package of policy measures covering a wide range of market-based, voluntary, and command-and-control approaches.

59. Another policy approach to preserving natural capital is wetland mitigation banking, a rights-based approach to restoring, creating, or enhancing wetlands in one place to compensate for impact on wetlands at another location. Pioneered in the United States (Box 5), wetland mitigation banking requires the separation of water rights from land titles to allow the separate trading of water rights. Like conservation banking, this approach is used to create property rights out of conservation work so that credits for the conservation of private land can be bought and traded for the right to undertake land development somewhere else. In the process, a whole new form of green business—mitigation banks—has been created.



#### **Box 4: Examples of Payments for Ecosystem Services Programs**

##### **Cidanau Watershed, Indonesia**

This program started in 2004 with one single private sector buyer/investor, Krakatau Tirta Industri (KTI), a water provider operating in the downstream area of the watershed. The private sector pays for sustainable land use management in the upstream area. Since the start of the program, there have been other investors, including Banten Province (provincial government) and Asahimas Chemical (chemical production). Following pilot phases from 2004 to 2014, the program began regular operations and has been successful to this day. Government agencies, the private sector, civil society, and the academe were all involved in developing guidelines for watershed management. The passage of Law No. 32/2009 on Environmental Protection and Management provided the program with an enabling framework for continued implementation.

##### **Vittel Catchment, France**

In 1992, Nestlé Waters France set up the Agrivair consulting firm as advisory and technical service support provider for the payments for ecosystem services (PES) program. This program was aimed at improving groundwater quality in the Vittel catchment by reducing nitrate pollution, including reducing agrochemical fertilizer use, animal waste, and manure application. The PES scheme encouraged farmers to shift to a chemical-free, hay-based dairy farming practice. This meant giving up maize cultivation for animal feed, adopting extensive cattle ranching, replacing composted manure, modernizing farm buildings for optimal waste management and storage, and providing technical assistance and linking farmers with new business networks. Several compliance measures were enforced; these included regularly monitoring farming practices and good use of new building facilities, and measuring nitrate levels in the soil. The land acquired in the process was to be returned to farmers in exchange for their adoption of new farming systems. Following the success in controlling nitrate pollution in Vittel, conservation efforts were expanded beyond the scheme to new sectors like biodiversity conservation in the adjacent Contrex and Hépar aquifers. One incremental benefit was the environmental reputation earned by Vittel Waters (Nestlé Waters) and the Vittel community. Nestlé Waters (through Vittel) commissioned a certification institute to design a biodiversity label dedicated to business biodiversity labeling.

Sources: S. Amaruzaman, N. P. Rahadian, and B. Leimona. 2017. Role of intermediaries in the Payment for Environmental Services scheme: Lessons learnt in the Cidanau watershed, Indonesia. In S. Namirembe, B. Leimona, M. van Noordwijk, and P. Minang, eds. *Co-investment in ecosystem services: global lessons from payment and incentive schemes*. Nairobi: World Agroforestry Centre. <http://www.worldagroforestry.org/publication/role-intermediaries-payment-environmental-services-scheme-lessons-learnt-cidanau>; and D. Perrot-Maître. 2013. *The Vittel Case: A Public-Private Partnership in the Mineral Water Industry. Case studies on Remuneration of Positive Externalities/Payments for Environmental Services*. Prepared for the Food and Agriculture Organization Multi-stakeholder dialogue. Rome. 12-13 September. [http://www.fao.org/fileadmin/user\\_upload/pes-project/docs/FAO\\_RPE-PES\\_Vittel-France.pdf](http://www.fao.org/fileadmin/user_upload/pes-project/docs/FAO_RPE-PES_Vittel-France.pdf).

### **Box 5: Wetland Mitigation Banking in the United States**

United States (US) wetland mitigation banking began as a policy response to the regulatory demands on construction companies and land developers. US federal regulations under the Clean Water Act (1972) require a permit for certain impact on wetlands and other water resources. In planning their development projects, firms must demonstrate that they have avoided and minimized impact on wetlands as much as possible. The remaining “unavoidable” impact on wetlands or wetland losses—also known as debits—must be replaced by wetland credits, generated to help meet the 1989 national goal of no net loss of wetlands.

Requiring compensatory mitigation measures, such as building new wetlands, is the most important element of the policy design. Private companies specializing in restoring, enhancing, or preserving wetlands purchase degraded wetlands and improve them to meet regulatory requirements. They then sell interest in their undertakings through wetland mitigation banks as mitigation credits to permittees. Private sector investors that sponsored these projects get a return on their investment after credits are sold.

The program is administered at the national level by 38 district offices of the US Army Corps of Engineers, in partnership with 10 regional offices of the Environmental Protection Agency. These two federal agencies in turn work closely with the states—a challenging task, in view of the different regulatory frameworks and governance cultures of the 50 states.

One of the most important ways of meeting this challenge and attracting private sector financing is having clear and effective, yet flexible, national standards for compensatory mitigation, including mitigation banking. The program has been successful, with most banks being sponsored by the private sector. By 2013, wetland bank sites had grown to 1,800 from 46 in 1992. In 2016, there were about 2,900 credit transactions at mitigation banks. Permittees spend between \$1.5 billion and \$2.2 billion annually on wetland/stream compensation credits, including bank credits. As a result, 24,000 acres of wetlands were created in 2015, and 18,000 were destroyed, compared with the 450,000 acres of annual losses from the 1950s to the mid-1970s.

Sources: P. Hough. 2016. *Wetland Mitigation Banking: Approaches to Credit Determination*. <https://k-learn.adb.org/materials/20161125/wetland-mitigation-banking-approaches-credit-determination>; and United States Environmental Protection Agency. n.d. *Section 404 of the Clean Water Act: CWA Section 404 Mitigation*. <https://www.epa.gov/cwa-404/cwa-section-404-mitigation>.

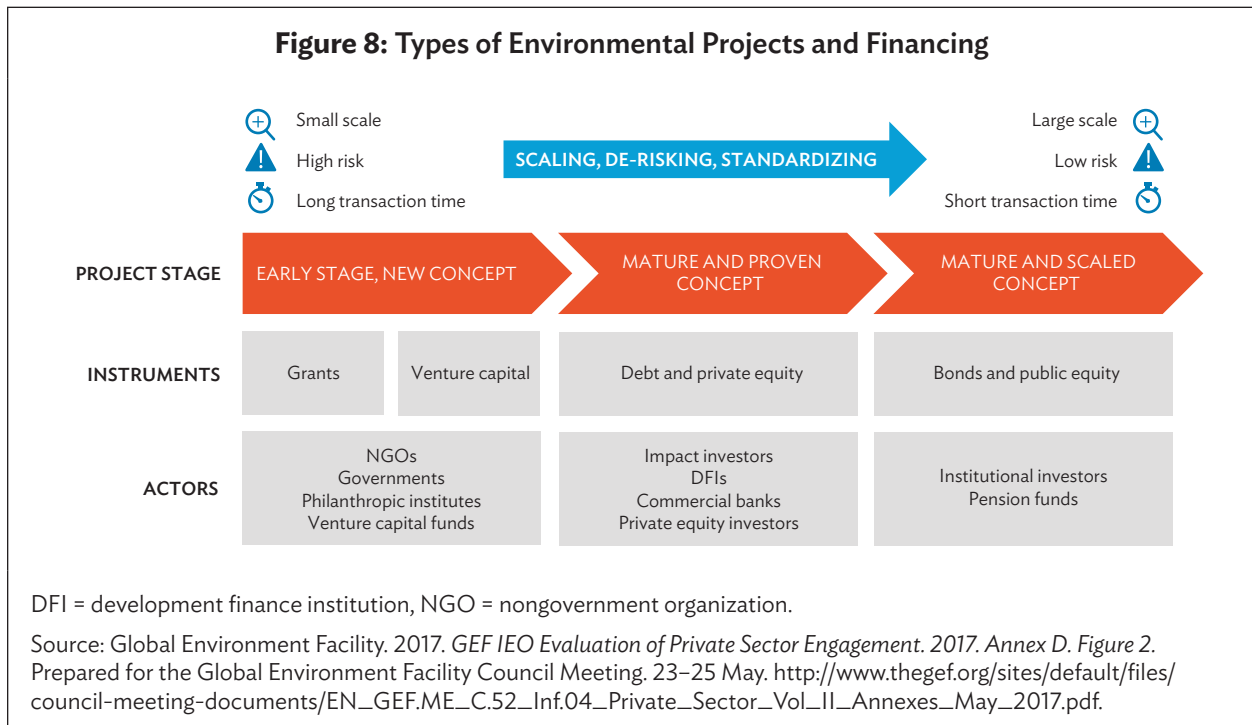
## IV. GREEN TECHNOLOGY INNOVATION

60. Green innovation policies and investments play a key role in supporting green business development.<sup>6</sup> There is a range of options available to governments, with policy instruments linked closely with the stage of market development.

61. Generally, improved regulatory and governance frameworks are needed to support private sector investments in green frontier markets, including prioritizing green projects, developing green key performance indicators, establishing knowledge centers and innovation labs to support private sector development, and setting up taxation systems to support green innovation. Governments can also preserve green state-owned assets through partial or full privatization, whose proceeds can support greenfield development.

### A. Public Support for Frontier Technology Innovation

62. As shown in Figure 8, the stages of support for green businesses begin with research and development, which requires significant support on the road to commercialization. This is true of new breakthrough or frontier technologies, as well as of adaptive technologies that require significant re-engineering to meet local conditions.



<sup>6</sup> Among emerging sectors, there is growing demand for investments in battery storage development to allow grid stabilization and reduce dependence on thermal power.

63. For early market R&D, governments can encourage innovation on the supply side by increasing their direct budget allocations for green development priorities and mainstream green innovation into ongoing development initiatives. Governments can also support procurement and demonstration programs, and step up subsidized loan and grant funding for R&D. The limited capacity of governments to monitor and control these resources presents opportunities for third parties, such as research institutions, think tanks, the academe, and nongovernment organizations (NGOs), to conduct independent monitoring of how governments allocate and use resources (Ponzi, Bowyer, and Tregidgo 2018).

64. Good R&D programs and infrastructure systems can push forward green business opportunities. National tax systems may be used to offer a combination of broad-based and sector-specific support for business R&D, which can be incremental and at the same time targeted at SMEs. Examples of such support are Malaysia's National Green Technology Policy, which promotes the adoption of green technology in water resource use and management, and Australia's R&D tax scheme for SMEs, which offsets some of the costs incurred by SMEs as a result of doing R&D on eligible activities (Australian Taxation Office 2016).

65. Green business incubators and similar venture support programs (including early-stage venture funding) via government or multilateral agency interventions can also help smaller firms scale up their activities. Taken together, these measures can accelerate the development of technologies and ease their passage from applied research to demonstration (Ponzi, Bowyer, and Tregidgo 2018). This stage is called the "Valley of Death" because it is here where most technologies fail to progress. For technologies that show promise and can attract the necessary investment, commercialization, economies of scale, and eventually mass adoption lie on the other side of the valley. Employing such high-end strategies, the Republic of Korea is investing more in innovation and deployment programs for 27 priority technologies in areas like energy efficiency and energy source technologies, and is catching up with other Organisation for Economic Co-operation and Development (OECD) countries in green competitiveness (Global Green Growth Institute 2015).

## **B. Incremental Innovation**

66. However, countries do not necessarily need to introduce new technology to become leading manufacturers. Instead, their innovation can be incremental. In this case, developing countries can adapt long-established technologies like solar and wind energy to local conditions through various technology transfer mechanisms. Countries like India, the Philippines, and Viet Nam often undertake incremental innovation through technology adaptation aided by large consumer bases and cost competitiveness in manufacturing (Fankhauser, Kazaglis, and Srivastav 2017).

67. In incremental innovation, developing Asian countries have a strong comparative advantage in certain climate change mitigation technologies such as solar photovoltaic. For example, India shows significant potential for adapting wind power and smart grids to local needs, while the Philippines excels in low-carbon metrics and efficient lighting (Fankhauser, Kazaglis, and Srivastav 2017).

68. Incremental innovation gives developing Asian countries opportunities to unlock value at the base of the economic pyramid. The key is finding inexpensive, “good enough” technologies with low infrastructure barriers that are accessible to the millions of under- and nonconsuming customers. It is not necessarily about creating new product features, but rather adapting existing products to customers with fewer resources or a different cultural background. Companies that have adopted this approach have often achieved strong market share and profit growth.

69. A good example of base-of-pyramid innovation is the Infrastructure Development Company Limited (IDCOL), a non-bank financial institution established by the Government of Bangladesh in 1997. IDCOL is bridging the financing gap for medium- to large-scale infrastructure and renewable energy projects. Projects like the solar home systems (see Box 6) have made IDCOL the market leader in private sector energy and infrastructure financing in Bangladesh.

### **Box 6: Solar Home Systems in Bangladesh**

The Solar Home Systems installation initiative has achieved great results in Bangladesh. Spearheaded by the Infrastructure Development Company Limited (IDCOL), the initiative has provided electricity to more than three million homes in the rural countryside in a relatively short period. In the process, IDCOL has helped generate about 141 megawatts of clean energy, saved more than 200,000 tons of fossil fuel per year, created over 75,000 jobs, and transformed the lives of more than 16 million people. By 2018, the program will have installed six million such systems across the country.

The technology behind this success is a small photovoltaic system that has the capacity to power only small appliances for just five hours per day. This appeals to millions of poor people in rural areas, whose previous reliance on expensive and polluting kerosene for lighting affected their businesses and children’s schoolwork.

Rather than focus on building a complex power grid and supporting distribution systems, IDCOL developed a solution that catered to the average nonconsumer, who needs only limited technology. The small systems—with a peak capacity of 20, 50, or 85 watts—allow small businesses to stay open at night and children to study longer.

IDCOL also created an integrated business model that provides financing to its partner organizations to enable them to give credit to end customers, and support services so that customers know what to do if the system breaks down or they have a billing problem.

Source: Infrastructure Development Company Limited. n.d. *Solar System Home Program*. <http://idcol.org/home/solar>.

## V. PRIVATE SECTOR GREEN FINANCE

70. As described above, governments can support the preparation of feasibility studies to help develop bankable projects for green investments, and deploy public funds through direct green investments as part of green innovation policies. Governments and DFIs can also support various green finance initiatives to provide the necessary long-term financial support to green businesses.

71. In simple terms, green finance involves efforts to internalize environmental externalities and adjust risk perceptions in order to boost environmentally friendly investments and reduce environmentally harmful ones. The focus can be on greening existing infrastructure spending or mobilizing additional investments in key sectors (e.g., agriculture and forestry, energy, water, transport).

72. Private capital expansion can be supported through public investments and institutions like central banks, DFIs, or institutional investors. This comes on the heels of governments' increasingly challenging task of mobilizing domestic resources for environmental protection and management. Because of fiscal restraints, in many countries, private finance will have to make up an increasing share of green finance over the long term. It is estimated that over 85% of the PRC's total green investment will need private financing (Green Finance Task Force 2015). To boost private green finance, governments can team up with central banks, DFIs, and institutional investors to implement measures that will increase capital flows, and develop innovative financial approaches across different asset classes (G20 Green Finance Study Group 2016).

73. DFIs can put forward several financing instruments to make green businesses more profitable by helping them increase existing capital, and create or further leverage an enabling environment for private investors. Three main categories of green finance—green banking, green bonds, and sustainable investing—are discussed below.

### A. Green Banking

74. Green banking involves working with banks to incorporate environmental risk management in their lending portfolios. In practice, this means making financing easier for environmentally conscious firms, and harder for polluting ones, thus helping to entrench best green practices in the business environment. Good examples of environmental risk management frameworks are the Equator Principles, which cover international project finance, and the United Nations Environment Programme (UNEP) Finance Initiative. Under the latter initiative, the UNEP has worked with the banking sector to establish systematic frameworks for managing ESG risks associated with supplying credit and raising capital for green investments, especially bank funding for renewable energy. Another recent development is the introduction of the Green Loan Principles (GLP), a set of market standards and guidelines for the green loan market based on four core components: (i) use of proceeds; (ii) project evaluation and selection; (iii) management of proceeds; and (iv) reporting. The scope of the GLP will eventually be expanded to cover new green finance models (Loan Market Association 2018).

75. Banks can also develop financing schemes to incentivize green investments. Support for energy service companies, such as the Bank of the Philippine Islands Sustainable Energy Finance Program, can mobilize financing for renewable energy and energy efficiency projects through amortization schemes where loan payments are calculated on the basis of businesses' potential savings when they invest in green technologies (BPI 2015).

76. There are opportunities for green banks to focus their efforts on supporting SMEs, most of which find it hard to gain access to green finance. SMEs—which are often informal, run by women, and located in rural areas—play an integral economic role in Asia, but remain a largely untapped market that presents a huge revenue generation opportunity for banks and financial institutions willing to introduce innovative financial products to them.

## **B. Greening the Bond Market**

77. Green bonds are debt instruments for financing green projects that deliver environmental benefits. They include corporate or project bonds issued to raise funds specifically for projects and activities supporting environmental sustainability, as specified in a number of frameworks such as the Green Bond Principles (GBP). The GBP is a voluntary process outlining the approach to green bond issuance, including: (i) the types of projects and activities that can be financed with green bond proceeds; (ii) project evaluation and selection; (iii) the tracking of green bond proceeds from issuance to disbursement; and (iv) environmental impact reporting (International Capital Market Association 2018). There are emerging certification mechanisms for green bond issuance, which are informed by the GBP and are aimed at clarifying the environmental benefits and minimizing risk (Ehlers and Packer 2017). A notable example is the Climate Bonds Initiative's Climate Bonds Certification mechanism, which certifies a bond's eligibility for issuance as a green bond on the basis of sector-specific criteria related to its low carbon value and suitability (Climate Bonds Initiative 2018).

78. The green bond market can provide an additional source of green financing for bank lending and equity financing. Expanding these markets could entail developing local green bond markets or promoting international collaboration to facilitate cross-border investment in green bond markets. A good local example is the Rainforest Impact Bond (RIB), Indonesia's first finance mechanism dedicated to forest protection (Marketwired 2015). Although RIB uses sovereign climate aid commitments, the use of the proceeds could be expanded beyond climate change to cover the conservation of natural vegetation and wildlife assets. In general, the scope of green bonds is expected to extend beyond climate change to nature-based assets such as wetlands, degraded lands, fisheries and aquaculture, land remediation, coastal infrastructure, and forests. Responding to growing interest among Asian investors and regional needs for sustainable infrastructure and energy markets, ADB launched its Green Bonds Framework in 2013; as of 2017, outstanding ADB green bond issuance amounted to \$3.3 billion (ADB 2018a).

## **C. Sustainable Investing**

79. Increasing interest from investors in incorporating environmental criteria in their decision making has raised sustainable investing to \$22.9 trillion, or 26% of all managed assets (Global Sustainable Investment Alliance 2017). Institutional investors include mutual funds, insurance companies, pension funds, and sovereign wealth funds. In Asia, sustainable investment assets compose only a small share of all professionally managed assets, but the landscape is beginning to evolve, driven by a growing awareness of the massive capital needed to finance the region's transition to an environmentally sustainable and low-carbon future. Investors are also taking a more active role as data have become more available (see Box 7). Firms like Bloomberg and Reuters now collect and disseminate such data, making it easier for investors to see whether green practices yield good results and how well they do so.

### Box 7: Sustainable Investing in Asia

Sustainable investing is an investment approach that considers environmental, social, and governance (ESG) factors in portfolio selection and management. It encompasses the following activities and strategies:

- |  |   |
|--|---|
| (i) Negative/Exclusionary screening    | (v) Sustainability-themed investing               |
| (ii) Positive/Best-in-class evaluation | (vi) Impact/Community investing                   |
| (iii) Norms-based assessment           | (vii) Corporate engagement and shareholder action |
| (iv) Integration of ESG factors        |   |

In Asia (including Japan), sustainable investments were just over 2% of total managed assets in 2016 (\$526 billion), compared with 26% globally. But the region has immense potential. The future potential in the region is immense. Currently, the largest Asian markets for sustainable investments are the People's Republic of China (PRC); Hong Kong, China; Japan; the Republic of Korea; and Malaysia. The fastest-growing markets are the PRC, India, and Pakistan.

ESG integration currently dominates in asset-weighted terms. However, the Rockefeller Foundation predicts that Asia—especially Southeast Asia—will be the next hub of impact investing. This involves targeted investments, typically made in private markets, aimed at solving social or environmental problems. Community investing, where capital is specifically directed at traditionally underserved individuals or communities, is in this category, as is finance provided to businesses for an explicit social or environmental purpose.

In India, impact investing is expected to have an increasing influence on the overall sustainable investment landscape. Intelicap, an India-based advisory firm focused on social enterprises, has estimated the capital invested in more than 220 impact enterprises across the country at \$1.6 billion. At present, most of the capital is sourced from outside India, but local institutional and high-net-worth investors are increasingly interested in impact investing as a defined investment strategy.

Source: Global Sustainable Investment Alliance. 2017. *Global Sustainable Investment Review 2016*.  
<http://www.gsi-alliance.org/members-resources/trends-report-2016/>.

80. As is the case with all policies, administrative simplicity is a must, particularly in developing countries. In addition, significant efforts must be made to educate the public, including the management staff of private sector companies. For example, although green bonds rely on well-known and proven mechanisms, investors may initially need help in understanding how these work. Rating agencies, such as Oekom, Vigeo, and Sustainalytics, can provide insights into companies' corporate sustainability performance, in addition to their financial performance. These ratings, using metrics such as the Global Reporting Initiative Sustainability Reporting Standards, are used by investors in considering green investments.

81. In these efforts, governments can look for opportunities to build capacity. There are growing knowledge-based capacity building platforms, such as the Sustainable Banking Network and the UN-backed Principles for Responsible Investment. These and other international and domestic green finance initiatives could be expanded to cover more countries and financial institutions.



## VI. PUBLIC FUNDS AND “BLENDED FINANCE”

82. To provide green start-ups with the long-term support that they need to grow and thrive, governments can make “blended” finance available, in collaboration with private investors and international aid providers. According to the World Economic Forum’s ReDesigning Development Finance Initiative, blended finance is “the strategic use of development finance and philanthropic funds to mobilize private capital flows to emerging and frontier markets” (World Economic Forum 2015).

83. Even small amounts of well-designed and targeted public investments can help break down barriers and catalyze the much larger flows of private finance necessary to unlock green business innovation on a wider scale (Polycarp, Brown, and Fu-Bertaux 2013). By leveraging the experience and skills of private sector management, governments can also address their lack of human resource capacity to manage these investments. Governments can pursue blended finance in three main ways.

### A. Concessional Finance

84. Governments and DFIs can participate directly in a given investment opportunity, with public investors providing debt or equity financing at market rates and terms—and in many cases below market rates—to encourage private investors. For instance, in 2008 the International Finance Corporation provided concessional finance from its Clean Technology Fund, leveraging private capital to spark investment in Thailand’s solar sector. The resulting “blend” of concessional rates and market rates made the project viable for developers and gave investors acceptable returns. Another example is the GEF, which under its Non-Grant Instrument Pilot Program offers flexible concessional interest rates to the private sector (see Box 8). This is part of the GEF’s overall program focused on the private sector. Appendix 6 describes the GEF’s program for private sector engagement.

85. Concessional loans and grant resources must be designed carefully such that the risk profile is sufficiently adjusted to attract appropriate investors without crowding out private capital or creating an unsustainable market that will depend on long-term government support. This risk can be minimized if a clear exit strategy makes way for an increase in private capital. In these efforts, governments must also ensure sufficient preparation of sizable green project pipelines through national government development planning or through financing facilities that support pipeline preparation. Without such pipelines, the larger volumes of private sector green finance will go elsewhere.

### B. “De-risking” Instruments

86. Public investors can also offer products (such as risk guarantees) that help mitigate specific types of risk, including credit, political, and systemic risk. Examples of such products are partial and full credit guarantees, political risk insurance, and currency swaps. By reducing the real and perceived risks surrounding a given investment, such products can help boost private investor confidence, especially in relation to high-risk projects.

### **Box 8: The Global Environment Facility's Non-Grant Instrument Pilot Program**

Drawing on its experience in using debt, equity, and risk mitigation products, the Global Environment Facility (GEF) has launched a \$110 million pilot program to demonstrate and validate the application of non-grant financial instruments to combat global environmental degradation. The GEF offers attractive financial terms for both public and private sector recipients. The terms for the private sector are as follows:

- (i) Flexible concessional interest rates;
- (ii) Minimum level of concessionality to avoid displacing other finance;
- (iii) First-loss position, if justified;
- (iv) Maximum maturity of 20 years; and
- (v) Flexible exit date for equity investments.

The resources can be used for projects that deliver global environmental benefits in one or several of GEF's areas of work, including biodiversity, climate change, international waters, land degradation, and chemicals and waste management. The funding size is flexible and expected to reach about \$15 million per project.

Proposals are especially encouraged if they (i) demonstrate innovative private and public sector application of financial mechanisms, business models, partnerships, and approaches to achieving the objectives of the GEF-6 strategies that may be broadly adopted and can be scaled up; or (ii) entail high levels of cofinancing, and focus on areas other than climate change.

Note: "GEF-6" is a reference to the sixth replenishment of the GEF (2014–2018).

Source: Global Environment Facility. n.d. *Non-Grant Instruments*. <https://www.thegef.org/topics/non-grant-instruments>.

87. Credit guarantees provided by governments or DFIs have proven very useful in on-lending agreements, where governments underwrite loans issued through intermediaries. For instance, in 2010, Malaysia launched the Green Technology Financing Scheme, under which the government provides a 60% guarantee of the loan amount and a rebate of 2% on interest charged by financial institutions for all qualifying projects (USAID 2014).

## **C. Grant-Based Funding**

88. A third form of blended finance involves support from public investors, typically in the form of grant-based funding or technical assistance, for efforts to identify or develop investment opportunities. Before extending investment support, public investors could fund feasibility studies to help prepare bankable projects as green investment opportunities in emerging and frontier markets.

89. Project Financing for Permanence (PFP), for example, enables countries to think big when it comes to environmental improvements. Tried most famously in Brazil and now in Bhutan (Box 9), PFP resembles the Kickstarter funding model: there is a single closing for donors to the cause, but the deal is not done until the full amount needed is raised. With PFP, conservation cannot be completed with a single payment, but rather needs ongoing and consistent funding (Mackay 2016).

### **Box 9: Project Financing for Permanence in Bhutan**

To help finance its conservation efforts in the face of low economic diversity, increasing human-wildlife conflict, and lack of enforcement capacity, Bhutan has put in place an innovative financing model with the assistance of the World Wide Fund for Nature (WWF). Called Bhutan for Life, the model is designed to bridge the \$40 million funding gap the country faces before it can fully finance its own conservation efforts in 15 years.

In addition to a single closing, Bhutan for Life also uses a transition fund. When the full \$40 million is raised, the money will be placed in the transition fund that makes annual payments as the government initiates specific conservation projects. The transition fund also anticipates the growth of Bhutan's economy through sustainable ecotourism over the coming years. Every year, the amount released by the transition fund will decrease, while the amount contributed by the Bhutan government will increase, until Bhutan has full financial responsibility for its environment.

The \$40 million will be used to pay the salaries of additional park rangers and conservation scientists, build ecotourism, and compensate local communities living in the parks. As of early 2016, Bhutan for Life was about halfway to its goal, with the money coming from large and small foundations, institutions, and individual wealthy donors. The funds are released each year, depending on the government's ability to meet the conservation requirements.

Sources: J. Leber. 2016. How the Tiny, Poor Country of Bhutan Became One of the Most Sustainable Countries on Earth. *FastCompany.com*. 11 March. [https://www.fastcompany.com/3057722/how-the-tiny-poor-country-of-bhutan-became-one-of-the-most-sustainable-countries-on-earth?show\\_rev\\_content](https://www.fastcompany.com/3057722/how-the-tiny-poor-country-of-bhutan-became-one-of-the-most-sustainable-countries-on-earth?show_rev_content); L. Mackay. 2016. Bhutan for Life; preserving the last Shangri-La. *CrowdfundVibe.com*. 29 May. <http://crowdfundvibe.com/bhutan-for-life-preserving-the-last-shangri-la/>.

## VII. MARKET-BASED APPROACHES FOR GREEN BUSINESS

90. Market-based policies address the main market failure that prevents efficient resource use and adequate investment in green opportunities and innovation—prices do not reflect the full costs of environmental resources such as energy, water, forests, land, and clean air. By taxing pollution or pricing water, for example, market-based policies provide an economically efficient approach to aligning economies with environmental sustainability by “getting the prices right” so as to internalize environmental externalities (Hallegatte, Fay, and Vogt-Schilb 2013; King, Olhoff, and Urama 2014).

### A. Innovative Approaches

91. Market-based instruments (MBIs) can be price-based or rights-based. Carbon pricing can be either one, depending on whether it is implemented under an emission trading system or through a direct tax.

- (i) Price-based instruments incorporate the negative externalities of production or consumption activities through taxes or charges on processes or products. Examples include emission charges, user charges, product charges, noncompliance fees, subsidies, removal of subsidies, and deposit-refund systems.
- (ii) Rights-based (or quantity-based) instruments are designed to control the quantity of the environmental good or service (or a suitable proxy) to a predetermined level. They create rights to use environmental resources, or to pollute the environment, up to that limit. Quantitative targets for pollution control are set at the aggregate (national or regional) level and allocated to individual firms, such that compliance by firms will achieve the aggregate target.

92. A clear advantage of MBIs is that they reflect the compliance decisions and preferences of businesses or private consumers in response to the incentives they face. This type of information, when revealed to the market, is materially relevant to product innovation and technology development. For instance, a price on pollution or resource consumption signals market demand for environmental goods and services, thus encouraging third-party innovators to invest in R&D operations (OECD 2010). To illustrate this point, consider how green business opportunities are supported or even created under traditional regulations. A firm has very limited options for abatement, and is typically required to adopt prescribed technologies for compliance. As a result, there will naturally be a steady stream of demand for green technologies from firms, but only from those involved in manufacturing or supplying such requisite technologies. A multiplier effect is created under a flexible mechanism as more options for abatement become available to firms. Under this setup, for instance, a firm can decide to use a certain technology and cut costs, and in the process create more opportunities for green business. It can even go a step further by investing in its own R&D, leading to higher costs but also to innovation gains. Innovation and additional green business opportunities can be fostered under flexible mechanisms like MBIs.

## B. Encouraging Innovation at the Company Level

93. Well-designed MBIs can stimulate innovation by improving business performance and making firms more productive and profitable (Porter and van der Linde 1995). They can encourage managers to undertake pollution control efforts that are both in their financial self-interest and conducive to the achievement of policy goals. MBIs do so by

- (i) giving firms flexibility in choosing their lowest-cost method of pollution abatement, rather than requiring all firms to achieve the same level of abatement;
- (ii) providing companies with incentives to make continuous progress in reducing their emissions without the need for government to reset technology standards (ADB 2018b); and
- (iii) equalizing the incremental cost of abatement across firms by allocating abatement among firms, then the costs of abatement decrease as pollution control increases.

94. In the process, firms can realize cost savings that compensate for the increased compliance and innovation costs. Innovation offsets occur when environmental regulations lead not only to fewer polluting products but also to higher-quality, lower-cost products as production becomes more efficient, less waste is generated, and waste disposal costs decrease.

95. If the goal is to lower the costs of pollution control and induce technological innovation, policy makers must recognize the importance of overcoming resistance to changes in corporate culture. The type of instrument and the way it is implemented can help entice firms to seek new opportunities to increase their competitiveness, instead of just focusing on avoiding problems and managing risks.

96. To this end, firms typically prefer quantity-based instruments to price-based instruments, as the former can lead to higher profits and, unlike taxes, do not require firms to pay for the remaining pollution emitted (ADB 2018b). Also, governments can induce firms to accept MBIs more easily and support them by returning to them the pollution fees charged, in the form of subsidies for abatement investments, or by giving firms tradable permits free of charge instead of through auctions (Harrington and Morgenstern 2004).

## C. Mix of Regulatory and Market-Based Approaches Is Ideal

97. Market-based policies offer some clear advantages over regulatory (command-and-control) approaches. On a macro level, one key advantage is that MBIs are designed to achieve the desired level of environmental benefits at the lowest cost and can thus lead to net gains in social welfare. In addition, governments can recycle revenues into a variety of programs and policies that promote green innovation. For example, France imposed a general tax on polluting activities and allocated a share of tax revenues for environment improvement, spending part of the revenue as capital subsidies for adopting recommended pollution control technologies (Ponzi and Bowyer 2018). Appendix 7 lists examples and provides a more detailed discussion and comparison of regulatory policies, market-based policies, and other support measures that enable green business transition.

98. However, despite the many advantages of MBIs, policy makers in developing countries must be careful not to rely too much on them. The effectiveness of market-based approaches can be hampered when other market failures (e.g., noncompetitive and missing markets, information asymmetries) are present.

99. The bottom line is that the success of market-based approaches to inducing green business activity hinges on overcoming some key obstacles (Box 10) and that such approaches should seek to supplement, rather than replace, existing government regulations. The fundamental challenge for policy makers in developing countries is to design policy instruments that are implementable and enforceable within the capacity constraints of regulatory agencies, while also providing cost-effective and long-term incentives for developing green technologies.

### **Box 10: Challenges in Implementing Market-Based Instruments**

Because of their complexity, market-based instruments (MBIs) require careful planning. The first challenge is lack of political will. Tax increases are difficult to sell politically, as their impact on energy and other commodity prices can cause social unrest and loss of consensus. Potential losers have a strong incentive to oppose MBIs that could hurt them. For example, Australia's mining industry launched a marketing campaign against the country's proposed carbon tax, and succeeded in having the tax removed.

In addition, some developing countries might not have the enabling conditions for developing and implementing innovative approaches. MBIs are often information-intensive,<sup>a</sup> difficult to design, and dependent on strong legal and institutional frameworks for enforcement. Developing credible mechanisms for monitoring and verifying environmental performance is also critical to implementing MBIs. For instance, wetland banking in the US requires good environmental governance, resourcefulness on the part of federal and state agencies, and well-defined private land ownership. These elements may be missing in many developing countries.

The many trade-offs in efficiency, ease of design, and implementation and distributional effects must also be considered. For example, if the main goal is to reduce emissions, a carbon tax is preferable to a renewable energy subsidy, since the former reduces energy demand and encourages a shift to renewable energy sources, while the latter only makes renewables cheaper. In addition, a carbon tax has the potential to decrease taxation inefficiency, while a subsidy worsens tax inefficiency by inducing more distortionary taxation.

<sup>a</sup> For example, the design of MBIs requires information about the costs of pollution control by enterprises, the options for abatement, the historical pollution levels of firms, and the tax or permit allocations needed to achieve the desired levels of abatement.

Source: P. J. Burke. 2014. Green Pricing in the Asia Pacific: An Idea Whose Time Has Come? *Asia and the Pacific Policy Studies* 1(3): 561–575.

100. Removing barriers to trade in a wide range of environmental goods will also help spur further innovation and promote technology investments in Asia. A global Environmental Goods Agreement is currently being negotiated. Its tariff deductions could cover equipment for air pollution control; solid and hazardous waste management, environmental remediation and cleanup, wastewater management and water treatment, noise and vibration abatement, and environmental monitoring, analysis, and assessment, as well as environmentally preferable products. In principle, reducing tariffs on environmental goods would make them cheaper and more accessible, and would help reinforce a shared Asian vision of environmental compliance at least cost, and better market access. An enhanced trading community would support both EGS and greening of business.

## VIII. SKILLS TRAINING FOR SMOOTH TRANSITIONS

101. New green businesses can create jobs in developing Asian countries.<sup>7</sup> In 2017, renewable energy (including large hydropower) employed over 10.3 million people around the world—5.3% higher than the 2016 figure—in contrast to the depressed labor market in the broader energy sector. The Asian countries with the highest number of renewable energy jobs were the PRC, India, and Japan. Solar photovoltaic was the largest employer, and wind power experienced strong growth (IRENA 2018).

102. In addition, skills development policies can help avoid investment bottlenecks, increase employment opportunities, smooth the transition of workers from declining sectors, reduce social tensions and inequality, and support inclusive growth (especially for marginalized and lower-skilled workers). Green skills programs can target worker groups in new occupations—such as solar technicians—or existing occupations that need to adapt to changing requirements, such as workers in the automotive industry or the agriculture sector. Effective policies actively engage partners from the private sector (including unions), and collaboration must happen at every level (enterprise, industry, and sector) (Hallegatte, Fay, and Vogt-Schilb 2013).

### A. Support at the Sectoral and Industry Levels

103. At the industry level, developed countries have made progress in improving training programs and certification schemes, together with industry skills councils or chambers of commerce. Best practices that could be replicated in developing countries include the QualiCert standard, a common approach to certifying small-scale renewable energy systems installers (French Environment and Energy Management Agency and EREC 2011).

104. India is a good model for a thematic, sectoral approach to addressing green skill shortages, particularly in support of marginalized or lower-skilled workers. To promote energy efficiency in buildings, the Indian Green Building Council and the Bureau of Energy Efficiency are conducting training programs for energy managers and a national certification examination for energy auditors (Government of India 2018). Meanwhile, agricultural training institutes are offering skill development courses in plant protection, pest management, and locust control. The Indian Council of Agricultural Research has also developed training programs in new and emerging areas such as organic farming, which have boosted farm productivity and enabled farmers to secure higher prices for their produce (Sanghi and Sharma 2012).

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<sup>7</sup> According to the International Labour Organization, green jobs are decent jobs that contribute to preserving or restoring the environment, whether they are in traditional sectors such as manufacturing and construction, or in new, emerging green sectors such as renewable energy and energy efficiency (ILO 2016).

## **B. Support at the Enterprise Level**

105. At the enterprise level, support programs can help SMEs' management staff understand better and overcome certain hurdles, such as limited access to finance and lack of awareness and information about the cost-saving potential of green practices and technologies. Sharing best practices in a business-friendly manner can complement other measures like targeted tax or subsidy relief. Assistance can also focus on helping SMEs access the supply chains of multinational companies that seek to establish green and fair conduct within their value chains (SWITCH-Asia, n.d.).

106. The SWITCH-Asia program of the European Union (EU) offers a good model for how SMEs can benefit from such assistance in a number of different sectors, including textiles, electronics, utilities, food and beverage, and tourism. The program promotes sustainable consumption and production practices throughout the region through sizable grants to various actors like business associations, research organizations, and NGOs (SWITCH-Asia, n.d.).

107. In 2016, the Philippine legislature passed the Green Jobs Act, an umbrella policy that sets out concrete provisions for businesses that generate and sustain green jobs, and incentives like special tax deductions equivalent to 50% of total costs for skills training and research development, as well as tax- and duty-free imports of eligible capital equipment. Asia could benefit greatly from the development of peer-to-peer learning platforms, or from existing business networks such as industry skills councils or local and international chambers of commerce (Congress of the Philippines 2016).



## IX. INFORMATIONAL APPROACHES FOR GREEN BUSINESS

108. Faced with the limitations of command-and-control approaches and MBIs, policy makers can also try other ways of devolving some responsibility for environmental protection to investors, producers, distributors, consumers, and the general public. Approaches include public disclosure programs, industry codes of conduct, certification, eco-labeling, and domestic voluntary agreements (Ponzi and Bowyer 2018).

109. Complementing this traditional and flexible policy mix are additional support measures—such as labeling and certification, public disclosure programs, industry codes of conduct, eco-labeling and certification, and domestic voluntary agreements—that remain underused. Policy makers can leverage these to share some of the responsibility for environmental protection. Under these business-oriented models, regulatory agencies typically partner with the private sector in encouraging businesses to engage in environmental self-regulation (Khanna 2002). One promising approach in the US is “Next Generation” compliance, which rewards increased dialogue between regulatory authorities and private companies to reach a common understanding of challenges and new solutions, including better reporting and increased transparency (Chertow and Esty 1997; US EPA 2018). Box 11 presents an overview of the features of Next Generation compliance tools.

110. A salient feature of green finance is its recognition of the economic externalities in financial systems. Accounting for this is important in order to adjust environmental risk perceptions to a reasonable degree. High-quality research data enhance the marginal productivity of capital, as will the increased relevance of the data to supporting the accuracy of adjustments and valuations. Making information more accessible through the development of better metrics and methods of collecting and analyzing a wide range of sustainability-related data and green business trends, and improving public-private and community partnership arrangements, will help accelerate data interchange and access throughout the region.

### A. Devolving Partial Responsibility to Consumers, Investors, and the General Public

111. The trend toward devolving partial responsibility for environmental protection, in response to the challenges inherent in environmental compliance, compensates for the inability of a small number of enforcement officials to police millions of polluters. With a focus on information and transparency, these business-oriented information models are being used by regulatory agencies in the US, the EU, and some developing countries. They entail encouraging corporate environmental self-regulation through a two-pronged strategy, in partnership with industry associations and third-party organizations (Khanna 2002):

- (i) Environmental agencies encourage firms to take a holistic perspective on pollution control and waste minimization through multimedia strategies, without changing the media-specific, end-of-pipe control focus of existing legislation.
- (ii) Regulators rely on publicly available environmental performance information about firms and products to create incentives (in the form of market forces and community pressure) for firms to self-regulate.

### Box 11: The Next Wave of Compliance

Next Generation compliance tools have been developed by the Office of Enforcement and Compliance Assurance of the US Environmental Protection Agency (US EPA), which is increasingly looking for more efficient ways of monitoring and enforcing environmental regulations. Next Generation approaches have been implemented in national air, wastewater, and cleanup programs in the US. Below are the five components of Next Generation compliance, with some examples of how these approaches are being adopted.

**Designing regulations and permits that are easier to implement.** To facilitate compliance with air quality standards, oil and gas companies can procure US EPA–certified air pollution control equipment from selected manufacturers. Companies can forgo the field-testing of equipment, while the government only needs to electronically compare the user’s purchase and installation reports with the manufacturer’s sales reports. This frees up resources for a heightened focus on downstream challenges.

**Using advanced technology for detecting pollutant emissions to improve transparency.** New monitoring and information technologies are becoming more accurate, mobile, and cheaper, allowing for real-time monitoring of both air and water quality. Technologies like infrared cameras can also detect invisible pollutants such as volatile organic compounds.

**Shifting to electronic reporting.** Software reporting tools can flag inconsistent or mathematically difficult entries, thus helping avoid problems and reducing transaction costs. A good example is the US EPA’s electronic Greenhouse Gas Reporting Tool.

**Making information more accessible to the public.** In programs like the Toxics Release Inventory, the US EPA requires firms to report and publish information, resulting in a significant drop in toxic emissions. The US EPA also provides user-friendly and easy-to-understand information to the public, through such means as an online tool for identifying the biggest contributors to water pollution problems.

**Using innovative enforcement approaches.** For example, to improve compliance with drinking water standards, the US EPA has launched a new scoring system to identify water suppliers with the most serious violations. Enforcement ensues after 6 months if violators do not comply. With increased federal and state attention, serious violations have significantly dropped.

Source: United States Environmental Protection Agency. 2018. *Next Generation Compliance*. <https://www.epa.gov/compliance/next-generation-compliance>.

112. The latter strategy enables consumers and investors to make informed choices, and to signal their preference for environmentally friendly firms. Specific policy instruments can be further distinguished according to several factors, such as the type of policy actor that organizes the instruments, the business sector at which they are targeted, and the types of compliance they require from participating businesses or investors.

113. In this regard, business-oriented measures and green finance are closely related. For instance, public disclosure and green certificates can complement green finance by making it easier both for banks to evaluate the feasibility of such projects and for manufacturers and users of green technology to have access to this finance. For instance, GreenTech Malaysia awards green certificates to projects that adopt green technology. These certificates complement the country's Green Technology Financing Scheme by making it easier both for banks to evaluate the feasibility of such projects and for manufacturers and users of green technology to access this finance (USAID 2014).

114. Devolving partial responsibility for environmental protection to consumers, distributors, investors, and the public is a response to the difficult challenges inherent in environmental compliance, namely the inability of a small number of enforcement officials to police millions of polluters.

## **B. Designing Informational Approaches in Developing Countries**

115. Several studies have examined the effect of information disclosure on capital markets and the stock market returns of firms, and on firms' environmental performance. While the findings vary across countries, some studies have found improvements in compliance as a result of public disclosure programs. However, public disclosure programs operate through their effects on investors and consumers, and these effects may not be as strong in developing countries. As most firms in developing Asian countries are small and privately owned, effects on the stock market are still limited. This is particularly true of countries where per capita income is low, people are less willing to pay for environmentally friendly products, and there is continued dependence on polluting firms for jobs (ADB 2018b). Nevertheless, the trend is slowly changing as incomes grow, and consumers increasingly opt for a healthy lifestyle and demand natural and organic products and services. Appendix 8 gives examples of existing support measures for green business development in the region.

116. Governments, however, cannot view public disclosure and other business-led programs as a substitute for weak regulatory and civil society pressures. The way forward should be a combination of voluntary approaches, law enforcement, and MBIs plus community, market, and civic pressures (Ponzi and Bowyer 2018). Multi-sector knowledge-sharing platforms, where members can share information and collaborate, can be one model for bringing these diverse approaches together. The Financial Innovation Lab, set up by the Inter-American Development Bank in 2015 and now being implemented in Central and South America, brings together public and private investors to exchange ideas and collaborate on the design of innovative financial mechanisms for sustainable development. In 2015, the Lab supported various projects, including climate risk financing in agriculture, energy savings insurance, a shift in investments from diesel to electric urban buses, and energy-efficient homes (Inter-American Development Bank 2018).

117. For SMEs, the threat of penalties and fines for noncompliance could help motivate firms to participate in public voluntary programs. To really support green SMEs, governments should focus their business-oriented programs on particularly polluting industries where small enterprises dominate (e.g., tanneries). Governments can also engage SMEs in other ways, like offering limited financial assistance. The Chinese government, for instance, provides training aligned with ISO 14001 standards and also subsidizes part of the certification fee (Zhu, Sarkis, and Geng 2005), which can range from \$2,000 to \$6,000 and thus be a barrier to entry for some smaller firms (Zhao and Xia 1999).

118. Governments can look to NGOs as partners, combining government resources with NGO expertise, helping to make oversight and effective auditing a greater deterrent against unfair practices. NGOs can serve as certifiers and auditors and can also publicly target polluting firms, potentially damaging corporate reputations and leading to loss of customers and investors. Organizations that coordinate certification schemes include the Forest Stewardship Council, the Roundtable on Sustainable Palm Oil, and the Earth Island Institute's International Dolphin-Safe Tuna Monitoring Program.

119. Governments should also encourage media to be more consistent in holding large companies accountable for their environmental management practices. Media outlets are effectively regulating an industry without relying on taxpayer money—the ideal cost-efficient public good. Notable examples include the *New York Times*' exposé on Thailand's shrimp industry, prompting regulatory reform (New York Times Editorial Board 2016). Social media can also play an increased role, as monitoring devices are becoming more accurate, more mobile, and cheaper, allowing for real-time monitoring for both air and water. Such advances can allow the public to more easily detect pollutant discharges, environmental conditions, and noncompliance.

## X. CONCLUSION

120. Advancing green business has clear advantages for all stakeholders. The key is to identify the opportunities and take up effective policies and support measures to realize them through a combination of economic incentives, voluntary approaches, and enforcement, as well as the development of community, market, and civic pressures. Similarly, businesses and investors across Asia, especially SMEs, have much to gain from enhanced market and financial access. However, to realize the full potential of green business in the region, much more private capital is needed. Asia's emerging markets are poised to lead the future growth of green business markets. Connecting to advanced economies like Australia, Japan, and Singapore can help achieve economies of scale, sharing of technology and ideas, job creation, and other spillover effects.

121. This paper has provided a review of green markets, technologies, and practices, especially green policies, with a focus on developing Asian countries. The trends are now clear, with the core technological and economic drivers of green growth widely recognized in both developing and industrialized economies.

122. Rapid changes in the automotive and electricity sectors, along with advancements in analytics, automation, and the Internet of Things have huge potential to reduce pollution and improve the efficiency of resource use. Further in the future, the world could see entire cities powered by renewable energy, regenerative agriculture techniques that can actually restore the environment, and carbon being used as input in industrial processes. There may even come a day when the circular economy vision is fully realized—a world where solar-powered factories have no smokestacks and products are sourced from nature and continuously recycled with no waste.

123. While a wave of green technological advances is undeniably coming, it is not certain at what speed developing Asian countries will continue to adopt these technologies or, better yet, become innovators in their own right. The pace and extent of technology innovation, adaptation, or absorption in the region will inform to a large extent global resource demand and environmental quality.

124. The degree of the “green” response of developing Asian countries will also help determine the pace of economic growth in the region. Policy makers and business leaders can either seize emerging opportunities, or sit by and watch others profit. Part of this challenge is to accept that the previous status quo is no longer the baseline. Those that embrace the inevitable green transformation will be rewarded.

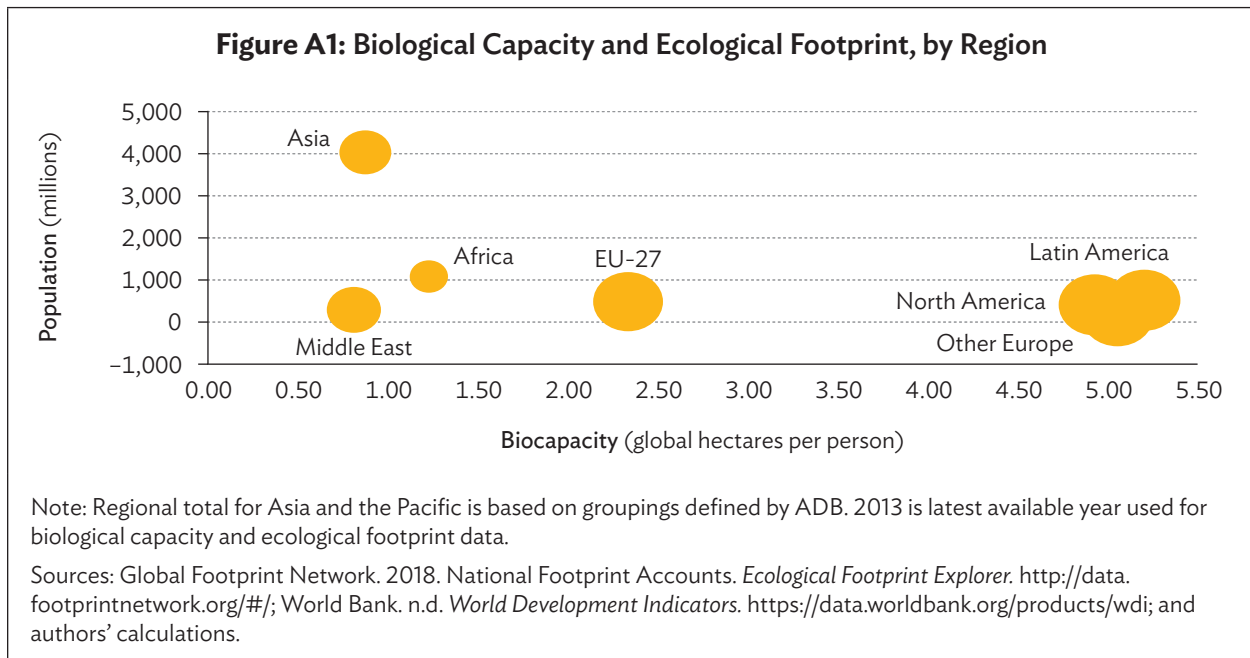
125. Policies supporting green business require a long-term consistent effort to strengthen institutional and governance capacity to manage, enforce, and monitor and evaluate policies. With a solid foundation and continued well-focused efforts by key stakeholders, new approaches to green business can help address the long-standing challenge of decoupling economic growth from negative environmental impact and natural-resource depletion. The growing momentum bodes well for eventually achieving the 2030 Agenda for Sustainable Development. There are tremendous opportunities ahead for those with the foresight to seize them.

# APPENDIX 1

## IMPACT OF ECONOMIC ACTIVITIES ON ECOLOGICAL ASSETS

Figure A1 shows both the ecological footprint and the biological capacity of each global region. The size of the bubble represents the ecological footprint (global hectares per person), which measures the ecological assets that a given population needs to produce the natural resources it consumes and to absorb its waste. In other words, it measures how fast the region consumes resources and generates waste. North America and the EU-27 have the largest ecological footprints, followed by the Middle East and Asia and the Pacific. Biological capacity (or bio-capacity) represents asset productivity; a negative net footprint suggests that demand exceeds what the region’s ecosystem can renew.<sup>1</sup>

The full costs of externality (social) capture private costs related to production and damage, including environmental compliance, pollution prevention, and health care. The cost burden is placed on both the private sector (e.g., polluting firm) and the public, and allocated through socially optimal means. Doing the latter protects both private and public interests.<sup>2</sup> Quantifying the social cost is historically difficult, but various valuation estimation methods are now becoming available and are widely accepted by policy practitioners. However, estimations in general remain notoriously cumbersome, time-consuming, and costly.<sup>3</sup>



<sup>1</sup> Global Footprint Network (2018).

<sup>2</sup> Coase (1960).

<sup>3</sup> Gunatilake and De Guzman (2008); and Gunatilake, Ganesan, and Bacani (2014).

## APPENDIX 2

### RELEVANT INTERNATIONAL ENVIRONMENTAL AGREEMENTS, DECLARATIONS, AND PROTOCOLS

**Table A2: Examples of International Agreements, Declarations, and Protocols for Managing Global Environmental Commons**

Treaty Name	Signature Year	Related Protocols and Declarations, or Amendments
Convention on Long-Range Transboundary Air Pollution	1979	Protocol on Persistent Organic Pollutants to the Convention on Long-Range Transboundary Air Pollution (1998), Protocol to Abate Acidification, Eutrophication and Ground-Level Ozone to the Convention on Long-Range Transboundary Air Pollution (1999), Amendment of Annex III to the Protocol on Heavy Metals to the Convention on Long-Range Transboundary Air Pollution (2012)
Montreal Protocol on Substances that Deplete the Ozone Layer	1987	Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer (1999), Adjustments to Annex C of the Montreal Protocol on Substances that Deplete the Ozone Layer (2007)
Convention on Biological Diversity	1992	Jakarta Mandate to the Convention on Biological Diversity (1995), Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2000), Nagoya–Kuala Lumpur Supplementary Protocol on Liability and Redress to the Cartagena Protocol on Biosafety to the Convention on Biological Diversity (2010)
Convention on International Trade in Endangered Species of Wild Fauna and Flora	1975	Amendments to Appendixes I and II (2007, 2013)
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal	1989	Amendments to Annex IX (2013)
International Convention for the Regulation of Whaling	1931	Amendments to the Schedule to the International Convention for the Regulation of Whaling, Sixty-Fifth Meeting (2014)
UN Convention to Combat Desertification	1994	Amendment Adding Annex V to the Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa (2000)
UN Framework Convention on Climate Change	1992	Paris Agreement under the United Nations Framework Convention on Climate Change (2015)

Source: R. Mitchell and the International Environmental Agreements Database Project. 2016. *International Environmental Agreements Database Project*. <https://iea.uoregon.edu/> (accessed 10 November 2017).

## APPENDIX 3

# REGULATORY AND OTHER EXTERNAL PRESSURES FOR IMPROVED ENVIRONMENTAL PERFORMANCE

Many Asian firms that are greening their operations are motivated by external pressures exerted by the government, foreign investors, and export markets. Expanding markets for green products and stocks, and tightening pollution standards, have elevated proactive environmental management to a strategic level in larger companies. For example, local firms in the People's Republic of China (PRC) submit to institutional pressure to adopt green practices for economic efficiency. The PRC government has begun to levy resource taxes and institute quota pricing for water resources. The National Development and Reform Commission, the Ministry of Finance, and the Ministry of Environmental Protection have removed tax incentives, restricted exports, and raised fees for polluting industries like those extracting steel, cement, and minerals.

Another key driver is external pressure from a global supply chain (suppliers, manufacturers, distribution centers, and customers). Chinese firms have faced increased green barriers to trade since joining the World Trade Organization in 2001. As a result, suppliers in the PRC have come under greater pressure to abide by international standards, such as the EU's Restriction of Hazardous Substances Directive.

Green supply chain management (GSCM) initiatives are a related factor especially in sectors producing consumer durables, metals, and electronics. GSCM initiatives respond to heightened scrutiny of large multinationals' supply chains to abide by more environmentally friendly practices.<sup>1</sup> Partly to help hedge against reputational risks, many multinationals are increasingly going green and demanding that their suppliers (and their suppliers' suppliers) do the same. The twin drivers of consumer demand and business demand are affecting a growing number of businesses in Asia, where nearly a tenth of the world's supply chains are located.

GSCM integrates environmental thinking into supply chain management. By focusing on optimizing resources, eliminating waste, and streamlining logistics, firms can reduce operating costs while helping—or at least mitigating damage to—the environment. GSCM strategies include, but are not limited to

- reducing packaging or changing package designs to make them reusable;
- investing in and developing environmentally friendly products;
- assessing suppliers on the basis of environmental performance; and
- reducing emissions and other pollutants associated with the transport of goods through better supply chain planning.

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<sup>1</sup> Diabat and Govindan (2011); and Lin and Sheu (2012).



For many businesses along global supply chains, GSCM pressures require an audit of production practices that search for opportunities to reduce waste and increase efficiency, thereby optimizing their own supply chains and transport routes. Thus, the drive to implement GSCM practices has evolved from a regulatory compliance burden into a way for companies to increase profit through resource optimization and waste reduction, while simultaneously reducing exposure to reputational risk. Standards such as ISO 14001 have helped create an atmosphere between suppliers and buyers where long-term relationships and trust can be more readily built and easily sustained.

A good example is Walmart, which is paving the way in GSCM by adopting an 80/20 approach whereby the most effort is targeted to where the company “can do the most good.” Walmart requires their suppliers from the PRC to adopt best practices, e.g., ISO 14001 certification. Initially focusing on the top 200 suppliers that made up roughly 80% of the supply chain, Walmart then spread this practice down to the company’s remaining suppliers and their suppliers’ suppliers.<sup>2</sup> To ensure compliance with ISO 14001, Walmart conducts random audits of firms against environmental criteria such as water discharge and hazardous waste disposal. Applying the GSCM effectively ensures a long-term outlook for green practices in contract negotiations.

Some highly profitable companies are going further by turning constraints into opportunities through innovation, embedding sustainability in their company cultures, and actively shaping their business environments. The World Economic Forum (WEF) dubbed these companies “new sustainability champions” in 2011 (Table A3).<sup>3</sup> From an initial pool of more than 1,000 companies, the WEF selected 16 proactive innovators on the basis of sustainability, innovation, and scalability criteria. Nine of the companies are in Asia.

According to a market survey, companies’ perceived benefits from adopting sustainable practices beyond compliance come in the form of increased customer base and profitability, and improved shareholder value. In other words, going green is increasingly seen as a business strategy, and less as pure altruism. Since the mid-2000s, the business case for companies to incorporate greener measures has progressively strengthened. It is based on cost cutting, the creation of new revenue streams, more efficient utilization of surplus material, the design of recyclable products, and the creation of take-back mechanisms for old products to facilitate recycling or upcycling. Behind these motivations are a number of key drivers, most notably, increased consumer awareness of sustainability, and the increasing costs of resources and supply risk. Green business models have been shown to convey financial rewards. According to a recent meta-study that categorized 200 different sources, 88% of the reviewed studies found that companies with robust sustainability practices demonstrate better operational performance, and 90% report that positive sustainability practices are positively correlated with a lower cost of capital.<sup>4</sup>

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<sup>2</sup> Orts and Spigonardo (2012).

<sup>3</sup> WEF (2011).

<sup>4</sup> Clark, Feiner, and Viehs (2015).

**Table A3: World Economic Forum’s New Sustainability Champions in Asia, 2011**

Company, Country/Area, and Sector	Highlighted Practice
Broad Group, PRC, Manufacturing	<b>Building awareness of the importance of sustainability.</b> This large producer of air chillers developed a miniaturized device for measuring air pollution that can fit inside a mobile phone. The device can help boost awareness of air pollution issues and even empower citizens by putting knowledge about air quality in the palm of their hand.
Jain Irrigation Systems, India, Manufacturing	<b>Educating customers.</b> India’s largest producer of micro-irrigation systems uses dance and song to explain the benefits of drip irrigation to local communities. With this innovative way of marketing, the company can convince and educate potential customers about its products. Not only does this approach help Jain to sell successfully, but it helps the company work collaboratively with local communities to improve its services and products.
Manila Water Company, Philippines, Infrastructure	<b>Finding ways to reduce the amount used.</b> To address lack of resources, one of the world’s most successful public–private partnerships drove down its levels of non-revenue water (NRW—water that does not reach the customer due to leaks or illegal tapping) from 63% in 1997 to 12% at the end of 2010. This was achieved partly by providing affordable supply to low-income areas, which turned probable NRW perpetrators into partners who now help prevent illegal tapping.
MTR Corporation, Hong Kong, China, Transportation	<b>Integrating sustainability into operations.</b> Making a clear link between sustainability and risk management, this train operator built a sophisticated framework—a Sustainable Competitive Advantage model—to guide its actions. As part of the framework, eight environmental impact assessment reports are mandatory for every project to develop a new rail line. The company also measures the impact of its projects on biodiversity, both before and after the construction stage—an approach that is rarely found in its industry.
New Britain Palm Oil, PNG, Agriculture	<b>Partnering to achieve multiple goals.</b> This vertically integrated producer of palm oil works closely with local NGOs to engage with local communities. The connections helped to smooth negotiations involving land rights—a critical issue since conflicts with suppliers and landowners are the largest barriers to palm oil operations in the region.
Shree Cement, India, Cement	<b>Finding ways to reduce the amount used.</b> Faced with limited access to low-cost energy, this large Indian cement manufacturer developed the world’s most energy-efficient process for making its products. The company has become the global benchmark. Cement companies from around the world visit Shree to learn from its innovations.
Suntech, PRC, Renewable Energy	<b>Providing customers with appropriate financing.</b> The largest solar panel manufacturer in the world cut the costs of its products to make them affordable to customers of limited means. Suntech also provides financial solutions that enable low-income customers to structure payments for its equipment. And when its photovoltaic cells reach the end of their life, the company takes them back for recycling.
Suzlon, India, Renewable Energy	<b>Influencing policies and standards.</b> This internationally renowned wind power producer uses its knowledge and experience to educate citizens and policy makers. The company helps shape the global debate on sustainability and renewable power through organizations such as the European Union Commission, the World Economic Forum, and the United Nations, as well as through an active media outreach program.
Zhangzidao Fishery Group, PRC, Aquaculture	<b>Exploiting the by-products of other companies’ outputs or processes.</b> This “ocean ranch” manager practices integrated multi-trophic aquaculture (IMTA), a more sustainable form of biodiverse fish farming that uses the waste of one species to feed another. IMTA aquaculture techniques allow Zhangzidao to increase production and economic diversification while reducing waste by converting by-products and uneaten fish feed into harvestable crops, reducing the need to introduce artificial feeds into the system.

NGOs = nongovernment organizations, PNG = Papua New Guinea, PRC = People’s Republic of China.

Source: World Economic Forum. 2011. *The New Sustainability Champions*. <http://reports.weforum.org/new-sustainability-champions/> (accessed 19 October 2018).

## APPENDIX 4 ESTIMATION OF THE ENVIRONMENTAL GOODS AND SERVICES MARKET

### Environmental Business International Inc. (EBI)<sup>1</sup>

As shown in Table A4.1, the EBI dataset takes into account 14 business sectors in three main areas: services, equipment, and resources. The data, interpretation, and analyses are crafted to serve the corporate development and planning needs of industry executives in the private sector and decision makers in the public sector. By tracking the size and growth of the environmental and climate change markets, EBI provides companies and investors with an independent source of financial data for business planning, benchmarking, and financing documents.

**Table A4.1: EBI Business Sectors**

<b>Environmental Services</b>		
Environmental testing and analytical services	Provide testing of “environmental samples” (soil, water, air, and some biological tissues)	Regulated industries, government consulting and engineering (C&E), hazardous waste, and remediation contractors
Wastewater treatment works	Collection and treatment of residential, commercial and industrial wastewaters. Facilities are commonly known as POTWs or publicly owned treatment works	Municipalities, commercial establishments, and all industries
Water utilities	Selling water to end users: Municipal entities and private companies	Consumers, commercial sector, all industries, institutions
Solid waste management	Collection, processing, and disposal of solid waste, and commercial collection of recyclables	Municipalities and all industries
Hazardous waste management	Collection, processing, and disposal of hazardous, medical waste, nuclear waste	Chemical, petroleum, manufacturers, government agencies
Remediation and industrial services	Cleanup of contaminated sites and buildings, and environmental cleaning of operating facilities	Government agencies, property owners, developers, industry
Environmental C&E	Engineering consulting, design, assessment, permitting, project management, operations and maintenance, monitoring, etc.	Industry, government, municipalities, waste management companies, POTWs

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<sup>1</sup> Environmental Business International (2016).

**Table A4.1: Continued**

<b>Environmental Equipment</b>		
Water equipment and chemicals	Provide equipment, supplies, and maintenance in the delivery and treatment of water and wastewater	Municipalities and all industries
Instruments and information systems	Produce instrumentation for the analysis of environmental samples. Includes info systems and software.	Analytical services, government, regulated companies
Air pollution control equipment	Produce equipment and technology to control air pollution. Includes vehicle controls.	Utilities, waste-to-energy, industries, auto industry
Waste management equipment	Equipment for handling, storing, or transporting solid, liquid, or hazardous waste. Includes recycling/remediation equipment.	Municipalities, generating industries, solid waste companies
Process and prevention technology	Technology for in-process pollution prevention and waste recovery	All industries
<b>Environmental Resources</b>		
Water utilities	Sale of water to end users	Consumers, municipalities, and all industries
Resource recovery	Sale of materials recovered and converted from industrial by-products or post-consumer waste	Municipalities, generating industries, solid waste companies
Clean energy power and systems	Solar, wind biomass, landfill gas, fuel cells, geothermal, small-scale hydro, energy efficiency and demand-side management	Utilities, all industries, and consumers

Source: Environmental Business International. 2016. *Global Environmental Market Datapack by Region 1996–2020*.

To generate and compile statistical information on a business segment, EBI uses a sell-side research methodology with proprietary databases in multiple industry segments, which is the engine for EBI market intelligence data, publications, and contract research services. This is done in several ways:

- generating and maintaining company databases in defined segments;
- developing survey instruments and executing surveys.
- identifying the top 30–100 companies in each segment.
- carrying out margin analysis modeling;
- conducting editorial research (executive interviews); and
- building and updating proprietary lists of product and service companies in defined segments of our target industries. Generally, most companies larger than \$5 million in sales are captured, although there are thousands of companies or departments and divisions of companies under \$5 million.

EBI designs and implements its own company surveys. Typically, surveys are aimed at executives in business development, marketing, and/or accounting. Surveys form the backbone of the EBI primary research data. Secondary data collection is focused on revenue of individual companies as well as estimates or reviews of similar markets by private, government, or academic researchers.

EBI creates market-size models by compiling the revenue contribution of the top 30–100 companies and modeling the survey responses and remaining unsurveyed population on the basis of estimates of the number of companies in each size category. These figures are reconciled against existing estimates, buy-side data, or other sources.

**UK Department for Business, Innovation and Skills (DBIS)  
(now the Department for Business, Energy and Industrial Strategy)<sup>2</sup>**

The definition of the low-carbon and environmental goods and services (LCEGS) sector is the result of 6 years of work with UK national and regional government and industry organizations. The definition was designed to fill the gap in current Standard Industry Classification (SIC) codes that has resulted in these activities being consistently overlooked and undervalued. It has also allowed the UK public sector to report, monitor, and develop LCEGS. The definition is broad and constantly evolving as new activities are identified or reach the market.

In the strictest sense, LCEGS is not a sector but rather a flexible construct or umbrella term for capturing a range of activities spread across many existing sectors with a common purpose—to reduce environmental impact. It is also an inclusive definition in that it includes both supply chain and value chain activities. It has 24 subsectors (Level 2 markets) subdivided into three broad categories: environmental, renewable energy, and low-carbon (Table A4.2).

**Table A4.2: LCEGS 24 subsectors**

Environmental	Renewable Energy	Low-Carbon
<ul style="list-style-type: none"> <li>• Air pollution</li> <li>• Contaminated land</li> <li>• Environmental consultancy</li> <li>• Environmental monitoring</li> <li>• Marine pollution control</li> <li>• Noise and vibration control</li> <li>• Recovery and recycling</li> <li>• Waste management</li> <li>• Water supply and wastewater treatment</li> </ul>	<ul style="list-style-type: none"> <li>• Biomass</li> <li>• Geothermal</li> <li>• Hydro</li> <li>• Photovoltaic</li> <li>• Wave and tidal</li> <li>• Wind</li> <li>• Renewable consulting</li> </ul>	<ul style="list-style-type: none"> <li>• Additional energy sources</li> <li>• Alternative fuel/vehicle</li> <li>• Alternative fuels</li> <li>• Building technologies</li> <li>• Energy management</li> <li>• Carbon capture and storage</li> <li>• Carbon finance</li> <li>• Nuclear power</li> </ul>

Source: UK Department for Business, Innovation and Skills. 2013. *Low carbon and environmental goods and services: 2011 to 2012*. <https://www.gov.uk/government/publications/low-carbon-and-environmental-goods-and-services-2011-to-2012>.

LCEGS data are derived in a different way from standard SIC-driven sector data or statistical survey data. LCEGS data uses market intelligence and involves the creation, qualification, and examination of new data values using techniques—data mining, data triangulation, deduction, induction, pattern recognition, and trend analysis—to produce high-level, processed, and exploitable economic information drawn from a very wide variety of sources. LCEGS addresses the lack of an accepted classification system and statistical base for measuring environmentally friendly and low-carbon activities wherever they occur within the economy. None of the main industry classification coding systems—SIC (United Kingdom), NAICS (US), NACE (EU), ISIC (UN) or ANZSIC (Oceania)—capture environmentally focused activities much beyond historically derived categories taken from the construction and utilities sectors.

<sup>2</sup> UK Department for Business, Innovation and Skills (2013).

## APPENDIX 5

### RECENT GREENING EFFORTS OF SELECTED HIGH-PERFORMANCE COMPANIES

Table A5 provides a list of best-practice examples from a sample of firm-level global data for various years. The examples shown are relatively modest in scope, yet useful for understanding the type of investments made by companies to improve environmental performance or lower environmental risks. The sample consists of nine large companies with impressive records in corporate environmental sustainability in some of the most resource-intensive industries; principal among these are soft commodities (e.g., agribusiness and food products, beverage, pulp and paper, and consumer products), as well as hard commodities (e.g., steel). The activities are wide-ranging and include technology installations for water and wastewater reuse, resource efficiency, pollution control and prevention, and recycling; research and development (R&D), and market-based conservation efforts.

**Table A5: Corporate Investments to Improve Environmental Performance, by Firm Level**

Company	Investment
<b>Siemens AG</b> (Germany) Global, Industrial  #1 Global 100 Most Sustainable Corporations in the World 2017 by Corporate Knights <sup>a</sup>  #9 Newsweek Green Countries in the World 2016 <sup>b</sup>	Siemens Water Strategy to reduce negative impact of water use <sup>c</sup> <ul style="list-style-type: none"> <li>• Optimized wells (Duisburg, Germany), resulting in savings of 40,000 cubic meters of freshwater per year and a €138,000 reduction in water cost</li> <li>• Involved in Action 2020 Water Project of the World Business Council for Sustainable Development (WBCSD) to promote efficient water use</li> </ul>
<b>McCormick &amp; Company</b> (United States) Global, Consumer Staples  #14 Global 100 Most Sustainable Corporations in the World 2017 by Corporate Knights (footnote a)	4R Framework <sup>d</sup> <ul style="list-style-type: none"> <li>• Reuse \$10 million investment in wastewater projects until 2018</li> <li>• Recycle transition from Bisphenol A (BPA) product packaging format product lines globally</li> </ul>
<b>Danone</b> (France) Global, Food Products	Danone Ecosystem Fund <sup>e</sup> <ul style="list-style-type: none"> <li>• Invested €71 million since 2009, with €113 million in co-funding from project partners</li> <li>• Endowment fund to support employment, skills and employability, and micro-entrepreneurship</li> </ul> <p>75 projects funded in sustainable product sourcing, watershed management and territory, distribution, caring services, and recycling</p>
<b>Asia Pulp &amp; Paper</b> (Indonesia) Global, Pulp and Paper	Belantara Foundation <sup>f</sup> Invested \$10 million each for 10 landscapes in the foundation <ul style="list-style-type: none"> <li>• Founding member, provides financing to support the protection, restoration, and development of social forestry across 1 million hectares of Indonesia forest</li> </ul>

*continued on next page*

Table A5: Continued

Company	Investment
<b>Asia Pulp &amp; Paper</b> (Indonesia) Global, Pulp and Paper <i>(continued)</i>	Environmental Expenditure Costs (footnote f) <ul style="list-style-type: none"> <li>• Waste disposal, emission treatment, and remediation costs: \$33.5 million in 2013, \$31.9 million in 2014, \$21.2 million in 2015, \$26.4 million in 2016, and \$31.2 million in 2017.</li> <li>• Prevention and environmental management costs: \$44.5 million in 2013, \$11.1 million in 2014, \$26.8 million in 2015, \$7.6 million in 2016, and \$10.3 million in 2017.</li> </ul>
<b>Pearson plc</b> (United Kingdom) Global, Consumer Discretionary  #33 Global 100 Most Sustainable Corporations in the World 2017 by Corporate Knights (footnote a)	Carbon Neutral Program <sup>g</sup> Protected 1,650 hectares of forests since 2009 through partnerships with Children's Tropical Forests UK, Woodland Trust, and Algona Highlands Conservancy
<b>POSCO</b> (Republic of Korea) Global, Materials/Steel  #35 Global 100 Most Sustainable Corporations in the World 2017 by Corporate Knights (footnote a)	Investment in facilities for pollution control and efficiency improvements, 2017 <sup>h</sup> <ul style="list-style-type: none"> <li>• Air quality control: KRW100.9 billion</li> <li>• Water quality control: KRW50.6 billion</li> <li>• Resource Recycling and others: KRW44.9 billion</li> </ul> Environmental Costs 2017 (footnote h) <ul style="list-style-type: none"> <li>• Costs for environmental facility operation and recycling: KRW801 billion</li> <li>• Environmental R&amp;D costs: KRW13 billion</li> </ul>
<b>Coca-Cola European Partners plc</b> (United Kingdom) Global, Consumer Staples  #48 Global 100 Most Sustainable Corporations in the World 2017 by Corporate Knights (footnote a)	Water Efficiency <sup>i</sup> <ul style="list-style-type: none"> <li>• In 2017, invested approximately €490,000 in process optimization and water-saving technologies, resulting in water savings of 4,648 cubic meters</li> <li>• Since 2010, reduced amount of water used to produce one litre of product by 11.78%</li> </ul>
<b>Arvind Limited</b> (India) Regional, Textiles	Waste Management <sup>j</sup> Santej Plant has been a zero liquid discharge plant since its inception in 1998 and is equipped with a wastewater treatment plant which recycles up to 98% of its effluent
<b>International Paper Company</b> (United States) Global, Pulp and Paper  Largest pulp and paper company in the world	Protecting US forestlands in partnership with the National Fish and Wildlife Foundation <sup>k</sup> <ul style="list-style-type: none"> <li>• Initial investment of \$7.5 million</li> <li>• Generated \$24.5 million in matching funds for a total conservation impact of \$32 million</li> <li>• Pledged \$10 million through the next 5 years (2016) for Forest Ecosystem Protection</li> </ul> Environmental Protection (footnote k) <ul style="list-style-type: none"> <li>• Achieved a 21% reduction in greenhouse gas emissions and 27% reduction in other air emissions since 2010</li> </ul>

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Table A5: Continued

Company	Investment
<b>Tata Group</b> (India) Global, Consumer products, chemicals, energy, engineering, information and communications, services, steel	Tata Motors Environmental Expenditure (2017–2018) <sup>l</sup> <ul style="list-style-type: none"> <li>Rs317.6 million spent on resource conservation; recycling, energy and material recovery, and environmental protection.</li> <li>Treatment and disposal of waste: Rs143.9 million</li> <li>Maintenance of pollution control equipment: Rs80.1 million</li> <li>External services for environmental management: Rs3.9 million</li> <li>External certification of management systems: Rs1.3 million (\$19,800)</li> <li>Extra expenditure for installing cleaner technologies: Rs14.1 million</li> </ul>
<b>Nestlé Waters</b> (Global) Owner of Vittel Water Company	Nestlé Waters established a public–private partnership in the mineral water industry in the Vittel catchment in France. <sup>m</sup> <ul style="list-style-type: none"> <li>Conservation efforts in the Vittel catchment were undertaken through a PES scheme. This was to provide an incentive to dairy farmers to adopt optimal farming practices</li> <li>Over €24.3 million was spent over the first 7 years (1989–1997). Of this total, €3.8 million was spent on farm equipment, €11.3 million on farm financial compensation, and €9.1 million on land acquisition</li> <li>PES program initially covered 6,000 hectares in Vittel catchment, was later expanded to contiguous aquifers, and now covers 10,000 hectares</li> </ul>
<b>Golden Agri-Resources Limited</b> (GAR) (Indonesia/Singapore) Global, Agribusiness/Food	Research and Development <sup>n</sup> <ul style="list-style-type: none"> <li>Increased sustainability through technology and R&amp;D to improve yield and agricultural practices</li> <li>Yield Improvement Policy launched in 2012</li> </ul>

Note: Investments made to improve environmental performance exclude energy-related activities.

<sup>a</sup> Corporate Knights. 2017. *2017 Global 100 Most Sustainable Corporations in the World*. <http://www.corporateknights.com/magazines/2017-global-100-issue/2017-global-100-results-14846083/>.

<sup>b</sup> Newsweek. 2016. *Top Green Companies in the World 2016*. <https://www.newsweek.com/green-2016/top-green-companies-world-2016>.

<sup>c</sup> Siemens AG. 2017. *Sustainability Information 2017*. [https://www.siemens.com/investor/pool/en/investor\\_relations/siemens\\_sustainability\\_information2017.pdf](https://www.siemens.com/investor/pool/en/investor_relations/siemens_sustainability_information2017.pdf).

<sup>d</sup> McCormick & Company. 2016. *A World of Responsible Solutions: 2016 Corporate Social Responsibility Interim Report*. [https://www.mccormickcorporation.com/our-commitment/~/\\_media/28f6fd7966d4453d87a79c0d9d7dc2c8.ashx](https://www.mccormickcorporation.com/our-commitment/~/_media/28f6fd7966d4453d87a79c0d9d7dc2c8.ashx).

<sup>e</sup> Fonds Danone pour l'Écosystème. 2017. *Our Impact*. <http://ecosysteme.danone.com/impact/>.

<sup>f</sup> Asia Pulp and Paper Group. 2018. *Sustainability Report 2017*. [https://asiapulppaper.com/system/files/app\\_sustainability\\_report\\_2017.pdf](https://asiapulppaper.com/system/files/app_sustainability_report_2017.pdf).

<sup>g</sup> Pearson PLC. 2018. *Shaping Tomorrow: Pearson Sustainability Report 2017*. [https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/sustainability/2017-reports/Pearson\\_2017\\_Sustainability\\_Report.pdf](https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/sustainability/2017-reports/Pearson_2017_Sustainability_Report.pdf).

<sup>h</sup> POSCO. 2018. *POSCO Report 2017*. [http://www.posco.com/docs/eng5/dn/sustain/customer/2017\\_POSCO\\_Report\\_EN.pdf](http://www.posco.com/docs/eng5/dn/sustain/customer/2017_POSCO_Report_EN.pdf).

<sup>i</sup> Coca-Cola European Partners. 2018. *Action on Water*. <https://www.ccep.com/pages/08-action-on-water>.

<sup>j</sup> Arvind. 2017. *2014–2016 Sustainability Report*. <http://arvind.com/pdf/ArvindSR.pdf>.

<sup>k</sup> International Paper. 2018. *2017 Global Citizenship Report*. <http://www.internationalpaper.com/docs/default-source/english/global-homepage/footer/gc-report.pdf?sfvrsn=44>.

<sup>l</sup> Tata Motors. 2018. *Shaping India's Future – Sustainable Mobility, Smart Cities: Sustainability Report 2017–2018*. <https://www.tatamotors.com/wp-content/uploads/2018/09/05090438/sustainability-report-2017-18.pdf>.

<sup>m</sup> D. Perrot-Maître. 2013. *The Vittel Case: A Public–Private Partnership in the mineral water industry. Case Studies on Remuneration of Positive Externalities/Payments for Environmental Services*. Prepared for the Food and Agriculture Organization Multi-stakeholder Dialogue. Rome. 12–13 September. [http://www.fao.org/fileadmin/user\\_upload/pes-project/docs/FAO\\_RPE-PES\\_Vittel-France.pdf](http://www.fao.org/fileadmin/user_upload/pes-project/docs/FAO_RPE-PES_Vittel-France.pdf).

<sup>n</sup> Golden Agri-Resources. 2018. *Research & Development*. <https://goldenagri.com.sg/sustainability/research-development/>.



## APPENDIX 6

# PRIVATE SECTOR ENGAGEMENT PROGRAM OF THE GLOBAL ENVIRONMENT FACILITY

The Global Environment Facility (GEF) has a long history of engaging business and catalyzing private sector investment. The organization draws on five different interventions to promote private sector engagement, and supports innovative financing models with the Instrument Pilot Program:<sup>1</sup>

- Transform policy and regulatory environments, including feed-in tariffs for renewable energy, incentives that guarantee markets for new approaches and encourage long-term investments.
- Deploy innovative financial instruments, including demonstrations and incremental financing for low-emission, climate-resilient investments, enabling private sector investment to flourish.
- Convene multi-stakeholder alliances to develop, harmonize, and implement sustainable practices, creating alliances to promote environmental objectives.
- Strengthen institutional capacity and decision making to improve information, participation, and accountability in public and private decisions.
- Demonstrate innovative approaches, including validation of a technology, a policy measure, or an approach to addressing environmental degradation that can spur broader adoption.

Under GEF-6 programming directions, opportunities for mainstreaming private sector engagement beyond climate change mitigation and adaptation are summarized below and in Figure A6.

**Chemicals.** Opportunities include working with nascent corporate alliances to manage e-waste; expanding private sector partnerships for polychlorinated biphenyl (PCB) disposal; and developing partnerships in green chemistry for new products and processes that reduce harmful by-products and toxic waste.

**Sustainable forest management.** Good examples are promoting landscape restoration by addressing the lack of regulatory policy and enhancing awareness, or forest certification through capacity building in underdeveloped markets. The GEF may also support policy risk insurance for vulnerable REDD+ projects that could catalyze private sector investment.

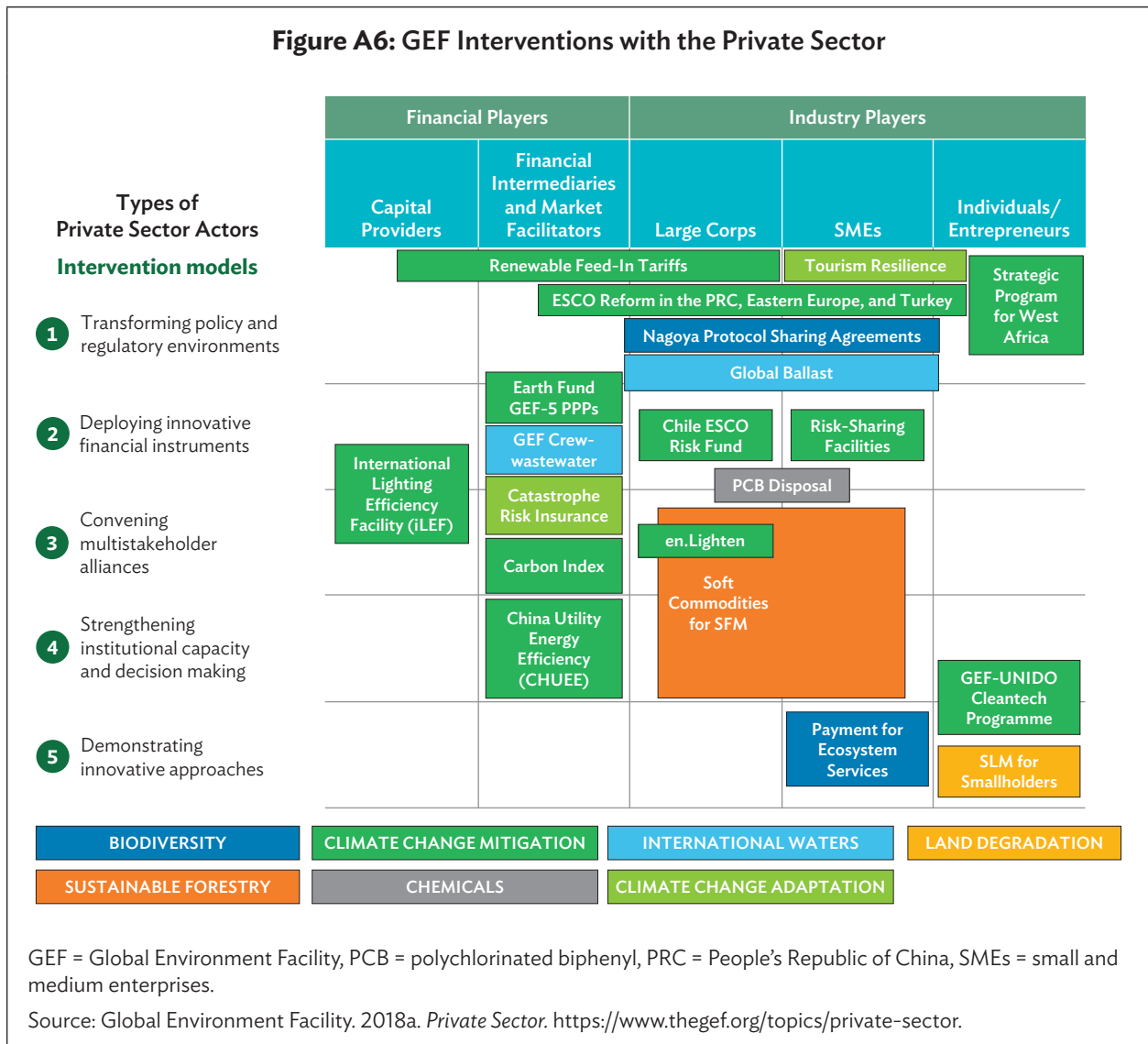
**Biodiversity.** GEF can help develop payment schemes for ecosystem services, thus expanding certification schemes hindered by inadequate financing. The organization also encourages corporate alliances, enabling policy, and capacity building with private sector actors along the entire value chain. The strategy likewise identifies ideas for expanded engagement in the Nagoya Protocol, where GEF support is rooted in the vision that obtaining access to genetic resources under the terms of the protocol can deliver both monetary and nonmonetary benefits to be shared with the providers.

**Land degradation.** Opportunities exist to work with private sector partners to promote climate-smart agriculture through capacity building for smallholders and SMEs, and potentially incremental financing or risk reduction for the adoption of sustainable land management principles.

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<sup>1</sup> GEF (2018a).

**Figure A6: GEF Interventions with the Private Sector**



**International waters.** There is great potential for partnerships with large corporate actors, following a successful partnership with shippers and the International Maritime Organization. Another example is working with the private sector to promote innovative, market-based approaches fostering good fishing practices and fishery management in large marine ecosystems and areas beyond national jurisdictions, or joint investments for joint management of surface water and groundwater along the entire supply chain.

Under the seventh replenishment of the GEF Trust Fund (GEF-7), the proposed strategy for engaging the private sector will adopt a two-pillar approach:<sup>2</sup>

- expanding the use of non-grant instruments; and
- mobilizing the private sector as an agent for market transformation.

<sup>2</sup> GEF (2018b).

## APPENDIX 7

# SUPPORT MEASURES FOR GREEN BUSINESS TRANSITION

The following policies help promote green business in different and complementary ways:

- Regulatory policies include regulations and standards that mandate changes in business practices.
- Market-based policies are fiscal or price signals that provide incentives for green action and address market failures.
- Support measures enable green business transition through government investment and support, as well as measures that focus on information and transparency.

### Regulatory Policies: Setting the Foundation for Green Innovation

**Standards.** Standards offer a clear definition of unacceptable actions and a focus on abating pollutants. They can take the form of either technology-based standards or performance-based standards. The former specify the best available abatement technologies that firms are required to install, typically to control pollution after it has been generated at the end of the pipe. The latter set quantitative limits for the level of pollution that companies can emit. For instance, in the water sector, technology standards set allowable treatment processes, while emission standards set permissible levels of pollutants in effluents, such as allowable concentrations of nitrogen, phosphate, metals, and biochemical oxygen demand. Firms are allowed to work out the best way to incorporate performance-based standards in their production processes.

**Public procurement.** Sustainable public procurement can exert an effect similar to large corporate supply chain requirements. By making winning public contracts conditional on certain environmental standards, governments can use their purchasing power to enforce environmental best practices down the entire length of a supply chain, and bolster demand for green products and services where private consumer demand is lacking. Green public procurement can also increase market acceptance of green products and services and encourage the private sector to invest with an eye to the long term. This sends the right signal for firms looking to make green investments, and can shift public perception that green is expensive. By making public contracts conditional on certain environmental standards, governments can create demand for green products, in turn normalizing green business models while bolstering employment in the green sector.

Table A7.1 presents examples of regulatory policies.

### Market-Based Policies: Encouraging Innovation through Flexible and Cost-Effective Approaches

Market-based policies address the main market failure that prevents efficient resource use and adequate investment in green opportunities and innovation—prices do not reflect the full costs of environmental resources such as energy, water, forests, land, and clean air. By taxing pollution or pricing water, these policies offer an economically efficient approach to aligning economies toward environmental sustainability by “getting the prices right” so as to internalize environmental externalities.<sup>1</sup>

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<sup>1</sup> GGBP (2014).

**Table A7.1: Examples of Regulatory Policies**

Air quality standards	The Republic of Korea established standards at the national level through its Clean Air Conservation Act, which is complemented at the municipal and regional levels by programs such as the Seoul Metropolitan Air Quality Control Master Plan. <sup>a</sup>
Technology standards	In the United States, the Environmental Protection Agency requires coal plants to install scrubbers, a type of flue-gas desulfurization equipment. <sup>b</sup> A number of other countries, with the People's Republic of China as a prominent example, have followed suit. <sup>c</sup>
Protected areas	Most countries in the Asia and Pacific region have copied the model of the US National Park System, with heavy use of protected areas. Insufficient resources for monitoring and enforcement, however, have limited the effectiveness of these policies.
Public procurement	In 2001, the Japanese government introduced the Green Purchasing Law, which obligates all state institutions to buy products like stationery, office furniture, and uniforms only from companies that are designated green. By 2007, over 95% of all purchased products were sustainably made. <sup>d</sup>
Recycling laws	For example, legislation such as the Home Appliance Act, which was passed in Japan, can help entrench re-manufacturing where older products and parts are restored or reused in new products. <sup>e</sup> Enforcement of the act has resulted in a total net benefit of 54 billion yen, and in 2012, the recycling rate stood at 91% for air conditioners, 82% for CRT televisions, 87% for LCD and plasma televisions, 80% for refrigerators and freezers, and 86% for washing machines and clothes dryers, higher than stipulated in the act.

CRT = cathode ray tube, LCD = liquid crystal display.

<sup>a</sup> Ministry of Environment, Republic of Korea, and Korea Environment Institute. 2008. *Korea Environmental Policy Bulletin*. 4 (6).

<sup>b</sup> R. Schmalensee and R. Stavins. 2013. The SO<sub>2</sub> Allowance Trading System: The Ironic History of a Grand Policy Experiment. *Journal of Economic Perspectives*. 27 (1). pp. 103-122.

<sup>c</sup> Y. Xu. 2011. Improvements in the Operation of SO<sub>2</sub> Scrubbers in China's Coal Plants. *Environmental Science Technology*. 45 (2). pp. 380-385.

<sup>d</sup> L. W. P. Ho, N. Dickinson, and G. Chan. 2010. Green procurement in the Asian public sector and the Hong Kong private sector. *Natural Resources Forum*. 34 (1). pp. 24-38.

<sup>e</sup> Y. Hotta, A. Santo, and T. Tasaki. 2014. *EPR-based Electronic Home Appliance Recycling System under Home Appliance Recycling Act of Japan*. Background paper for Global Forum on Environment: Promoting Sustainable Materials Management through Extended Producer Responsibility. 17-19 June.

However, the effectiveness of market-based approaches might be hampered when other market failures (e.g., noncompetitive and missing markets, information asymmetries) are present. Several examples of MBIs are presented in Table A7.2.

**Price-based instruments.** MBIs incorporate the externalities of production or consumption activities through taxes or charges on processes or products. These include emission charges, user charges, product charges, noncompliance fees, subsidies, removal of subsidies, and deposit refund systems. Such instruments can be categorized according to the monitoring burden they place on regulators.<sup>2</sup>

<sup>2</sup> Blackman and Harrington (2000).

**Table A7.2: Examples of Flexible Policies**

MBI Type	Description
Water pricing	Pricing can have a positive or a negative effect. In Singapore, water pricing policy has been used since 1997 to integrate the ecological costs of water and streamline the rate on the basis of the amount of water used. <sup>a</sup>
Emission fees	Japan has had emission fees for sulfur oxide emissions since 1974, with the resulting revenues being destined for victims of air pollution.
Pollution reduction subsidies	Subsidies can reward firms for reducing pollution from a free-market baseline level to a targeted level. They generate revenue for firms that reduce pollution below the baseline level.
Congestion pricing	By taxing drivers for the right to use certain roads through congestion pricing, jurisdictions can reduce road congestion and the resulting pollution and public health problems. Singapore has the world's most sophisticated system of congestion pricing, which has helped it avoid the major congestion problems that its neighbor countries suffer. Jakarta and Beijing are considering similar systems, but most roads in the Asia and Pacific region remain free-access. <sup>b</sup>
Payment for ecosystem services (PES)	Although the use of MBIs for biodiversity conservation in the Asia and Pacific region is underdeveloped, there are several interesting examples of PES policies. These policies provide payments to landowners for the environmental benefits of maintaining biodiversity on their property.
Agro-environmental payments	A form of PES, these payment schemes can be designed to encourage farmers to adopt environmentally friendly farming techniques that go beyond legal obligations (e.g., limiting the use of pesticides). In return, farmers receive payments that provide compensation for additional income foregone as a result of applying these practices.
Tradable permit programs	These have been implemented in the United States to reduce sulfur dioxide emissions from power plants.
Wetland banking	With wetland banking, private companies purchase the property rights to degraded wetlands and rehabilitate them to meet defined regulatory requirements, for which they earn credits. These companies then sell the credits to construction and development firms that are required, by law, to offset the environmental impact of their land development activities. <sup>c</sup> The rapid rates of urbanization and biodiversity loss in the region's wetlands suggest that there is considerable potential for systems like wetland banking.
Nutrient trading	This method provides a mechanism for using nutrients for the best economic gain, while also limiting the amount of nitrogen entering waterways. It involves placing a cap on total nutrient losses within a catchment area and introducing a system of nutrient allowances (credits) that can be bought and sold. Enterprises with high nutrient requirements, such as dairy farms, can purchase credits from enterprises with surplus allowances.
Conservation offsets	Also known as biodiversity offsets or conservation allowances, these are actions taken by companies that help compensate for significant adverse impact from development. They hold great promise within a larger eco-compensation program to support the management of key ecological zones. If impact in these zones cannot be prevented or mitigated, a company can complete the restoration itself or pay another company that has already restored an equivalent type of land.

MBI = market-based instrument.

<sup>a</sup> UN ESCAP. 2012. Integrating Environmental Costs to Tackle Scarcity: Singapore's Water Pricing Policy. *Low Carbon Green Growth Roadmap for Asia and the Pacific*. <https://www.unescap.org/sites/default/files/41.%20CS-Singapore-water-pricing%20policy.pdf>.

<sup>b</sup> P. J. Burke. 2014. Green Pricing in the Asia Pacific: An Idea Whose Time Has Come? *Asia and the Pacific Policy Studies*. 1 (3). pp. 561–575.

<sup>c</sup> H. Gunatilake and F. D. De Guzman. 2008. Market-Based Approaches for Managing the Asian Environment: A Review. *ADB Economics Working Paper Series*. No. 124. Manila: Asian Development Bank. <https://www.adb.org/publications/market-based-approaches-managing-asian-environment-review>.

Direct instruments, such as emission charges, require regulators to monitor actual emissions and pollutants. Emission taxes make it worthwhile for a firm to reduce its emissions to the point where its marginal abatement cost is equal to the tax rate. Examples are taxes on nitrous oxides from utility boilers in Sweden and France, and effluent and landfill taxes in the Netherlands. Conversely, indirect instruments (e.g., product charges) do not require such monitoring. There are advantages to this approach, as many governments find it easier to measure quantities and movements of goods than to monitor emissions. This is particularly true in developing countries, where government tax collection agencies tend to be more established and effective than environmental agencies. However, a drawback is the difficulty in linking the taxed good with the actual emissions involved in producing that good. This raises the question of which good to tax—the final product, the inputs used in polluting activities, or the polluting substance itself. A special case of pollution charges is a deposit refund system, where consumers pay a surcharge when purchasing potentially polluting products, and receive a refund when returning the product to an approved center for recycling or disposal. This approach has been used to reduce solid waste disposal by encouraging the recycling of cans, bottles, and batteries.

Another example is deposit refund schemes, which can be used to address many environmental problems beyond waste disposal such as air and water pollution. By imposing an up-front fee on production or consumption, and using that revenue to rebate green inputs and mitigation activities, a deposit refund policy can operate efficiently like a non-regressive pollution tax to control pollution.<sup>3</sup>

**Quantity-based instruments** control the amount of the environmental good or service (or a suitable proxy) to a predetermined level. They create rights to use environmental resources, or to pollute the environment, up to that limit. Quantitative targets for pollution control are set at the aggregate (national/regional) level and allocated to individual firms, so that compliance by firms will achieve the aggregate target. A classic example is emission trading schemes. These systems place a limit or cap on emissions (SO<sub>x</sub>, NO<sub>x</sub>) for specific economic sectors or jurisdictional regions. Businesses under that system are usually allocated a fixed amount of emission rights. If a business is unable to meet its emission allocation, it can buy emission rights from other businesses and institutions that have managed to emit less carbon. This buying and selling of permits results in a price for pollution. Individual firm-level abatement is determined by the relative costs of abatement and response to the price that results from the aggregate target. These instruments provide certainty about the environmental outcome, but not about the cost to industry of achieving that outcome.

### **“Business-Oriented” Support Measures**

Faced with the limitations of command-and-control approaches and the challenges inherent in MBIs, policy makers can also devolve some of the responsibility for environmental protection to consumers, investors, and the general public. With a focus on information and transparency, these measures can include public disclosure programs, corporate codes of conduct, certification, and eco-labeling (Table A7.3). These approaches can be further distinguished according to several factors, such as the type of actor that organizes them, the target sector, and the types of compliance required from participating businesses or investors.

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<sup>3</sup> Walls (2011).

**Table A7.3: Examples of Business-Oriented Approaches**

Environmental disclosure programs	<p>Public disclosure programs allow investors, customers, and environmental interest groups to evaluate and compare firms on the basis of their environmental performance.</p> <ul style="list-style-type: none"> <li>• Many developing countries have pilot-tested public disclosure programs. Examples are the Green Watch Program (PRC), Green Rating for Integrated Habitat Assessment (India), PROPER (Indonesia), and EcoWatch (Philippines).</li> <li>• The stock exchanges of the Republic of Korea, Singapore, Thailand, and Viet Nam have joined the United Nations Sustainable Stock Exchanges Initiative, which encourages listed companies to disclose information about their social and environmental performance to investors.<sup>a</sup></li> <li>• The Indian Ministry of Corporate Affairs' new Corporate Social Responsibility (CSR) policy makes it mandatory for large firms to set aside at least 2% of their average net profit for CSR projects.</li> </ul>
Certification and eco-labeling schemes	<p>A wide range of certification schemes in a number of sectors can grant a company or investor access to a premium market.</p> <ul style="list-style-type: none"> <li>• High-profile international schemes include: the Forest Stewardship Council (FSC, for responsibly managed forests), Energy Star (energy-efficient appliances), and dolphin-safe labels (for canned tuna).</li> <li>• The Roundtable on Sustainable Palm Oil has developed a set of environmental and social criteria that companies must comply with to produce certified sustainable palm oil.</li> <li>• The US Green Building Council's Leadership in Energy and Environmental Design (LEED) promotes sustainability in building design, construction, and operation. Plummy Fashions, a garment manufacturer in Bangladesh, earned LEED certification and has seen a 40% reduction in energy use and a 41% reduction in water use, among others.</li> <li>• Other schemes, such as Eco Mark (Japan), Ecomark (India), and BCA Green Mark (Singapore buildings), are country-specific.</li> </ul>
Industry/Corporate codes of conduct	<p>These represent a set of standards that companies and institutions can apply in order to reduce their environmental footprint.</p> <ul style="list-style-type: none"> <li>• ISO 14001 is perhaps the most important one globally. Firms can enjoy a competitive advantage through improvements in operating performance, higher efficiency, and lower costs of production.</li> <li>• Another example is the Equator Principles, which provide a risk management framework to help financial institutions assess and manage environmental and social risk in project finance.</li> <li>• Several green business networks have established codes of conduct and responsible environment practices for firms. These networks include the World Business Council for Sustainable Development, the World Industry Council for the Environment, CERES, and the Global Reporting Initiative.</li> </ul>
Industry-led voluntary efforts	<p>The private sector can seek to establish stricter environmental standards, which can eventually become policy as well. An interesting example comes from the shipping industry of Hong Kong, China, and the Fair Winds Charter. The industry committed itself to using low-sulfur fuel and the government, in turn, provided a subsidy to reduce the cost of the more expensive fuel. Shipping leaders then requested the government to introduce legislation requiring ships to use the cleaner fuel in Hong Kong, China, the world's fourth-busiest container port.<sup>b</sup></p>

PRC = People's Republic of China, PROSPER = Program for Pollution Control Evaluation and Rating.

<sup>a</sup> United Nations Sustainable Stock Exchanges Initiative. 2016. *2016 Report on Progress*.

<sup>b</sup> M. L. Clifford. 2015. *The Greening of Asia: The Business Case for Solving Asia's Environmental Emergency*. New York.

Under these “business-oriented” models, regulatory agencies in the US, the EU, and a number of developing countries are partnering with industry associations and third-party organizations to encourage corporate environmental self-regulation.<sup>4</sup> This involves a two-pronged strategy. First, environmental agencies encourage firms to take a holistic perspective toward pollution control through multimedia strategies and waste minimization without reforming the media-specific, end-of-pipe control focus of existing legislation. Second, regulators rely on the provision of environmental performance information about firms and products to the public to create incentives (in the form of market forces and community pressure) for firms to self-regulate. The latter strategy enables citizens to make informed choices, and to signal their preferences for environmentally friendly firms. Such signals can be transmitted through the product or through the capital and labor markets, thus making existing private markets work better. Rational profit-maximizing corporations have incentives to respond to these signals, and become more environmentally responsible if they expect tangible or intangible benefits that outweigh the costs of such efforts.

Improving reporting and expanding transparency are features of next generation (Next Gen) compliance, an alternative approach being implemented in the US. Instead of more government-led methods, Next Gen stresses increased dialogue between regulatory authorities and private companies to reach a common understanding of challenges and new solutions.<sup>5</sup> What sets Next Gen apart from other business-oriented approaches is its integrated and modern approach to compliance, taking advantage of new tools and approaches while strengthening vigorous enforcement of environmental laws. It consists of five components, with a common collaborative approach between regulatory authorities and private companies. Aided by advances in information and emission monitoring technology, a move toward real-time electronic information regarding environmental conditions, emissions, and compliance will make it easier for firms to comply than to violate.

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<sup>4</sup> Khanna (2002).

<sup>5</sup> Chertow and Esty (1997).



## APPENDIX 8

### SOME EXISTING SUPPORT MEASURES FOR GREEN BUSINESS DEVELOPMENT IN ASIA AND THE PACIFIC

**Table A8: Policies and Support Measures for Green Business Development in Asia and the Pacific, Excluding Those Related to Energy**

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Afghanistan</b>				
National Environmental Protection Agency (NEPA) <sup>1</sup>	<p>NEPA, created in 2005, is the primary climate change and environment-related policy-making body and coordinating agency in Afghanistan.</p> <p>The country has no specific green business-related policies; however, the Afghanistan National Development Strategy (ANDS) 2008–2013 does place a value on natural resource conservation and management.</p>	Environment	Policy	NEPA
<b>Armenia</b>				
Armenia Development Strategy 2014–2025 <sup>2</sup>	<p>The strategy is aimed at the development and adoption of a law on environment protection policy to address environmental risks associated with resource-intensive businesses (i.e., mining and forestry).</p> <p>Other key policies to be developed include: drafting methodologies for assessing environmental damage, revising nature use charges (taxes), and creating incentives toward a “green economy.”</p>	Environment	Fiscal measure	Government of Armenia
Small Business Act 2016–2018 <sup>3</sup>	The act encourages SMEs to become involved in resource-efficient activities and green production services as a way of increasing the competitiveness of those businesses.	SMEs	Support measure	Government of Armenia

*continued on next page*

**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
Greening Economies in the European Union's Eastern Neighbourhood (EaP GREEN Programme) <sup>4</sup>	The Ministry of Economic Development and Investments committed itself to including SME greening in the National SME Development Strategy as a result of the EaP GREEN Programme.	SMEs	Support measure	Ministry of Economic Development and Investments
<b>Australia</b>				
Threatened Species Conservation (Biodiversity Banking) Regulation (2008) <sup>5</sup>	Australia's Environment Protection and Biodiversity Conservation (EPBC) Act Environmental Offsets Policy of 1999 provided umbrella guidance on the practical applications of the EPBC Act, including environmental offsets. This act later enabled the Bio-banking Regulation 2008, which provides the mechanism for delivering environmental offsets. This regulation sets the requirements for assessing lands that are not suitable for bio-banking sites, people who can establish bio-banking sites, operations of the trust fund, and required payments.	Environment  Biodiversity conservation including habitat and vegetation	Law  MBI	New South Wales Department of Environment, Climate Change and Water (DECCW)
Commonwealth On-Farm Further Irrigation Efficiency (COFFIE) <sup>6</sup> Program	The COFFIE program is a direct grant for water resource use and efficiency. The program provides funding for irrigation infrastructure upgrades and other on-farm water efficiency activities. Water savings from farms are then transferred to the Commonwealth.  A total of A\$1.575 billion in funding is available for COFFIE and other efficiency programs, with an allotment of A\$35 million for the pilot phase in late 2017. Irrigators may volunteer for COFFIE until 2019; however, until 2024, only Commonwealth-managed farm operations will receive the funding.	Water	Indirect fiscal (non-tax) measures	Australian Government Department of Agriculture and Water Resources

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
Australian Packaging Covenant (APC) <sup>7</sup>	<p>APC is a sustainable packaging initiative begun by companies in the supply chain that is aimed at changing the culture of business to enable the design of more sustainable packaging, increase recycling rates, and reduce packaging litter.</p> <p>Grants are available to industry, to enable industries to focus on initiatives related to glass and plastic recycling programs. Over A\$6.1 million (\$6.3 million) in funding was provided to 40 new projects in FY2012–2013.</p>	Resource efficiency and waste management	Indirect fiscal (non-tax) measures	Australian Packaging Covenant Council
Grant Ready Research and Development (R&D) Tax Incentive (2016) <sup>8</sup>	The tax incentive program is aimed at increasing research and development by Australian businesses. It also encourages smaller companies to engage in R&D.	Tax incentives	Incentive program	Government of Australia Grant Ready
<b>Azerbaijan</b>				
Green Tax and Green Economy <sup>9</sup>	<p>A fee payment system for environmental damage has been implemented since the 1990s; however, not much money is being collected from it. In 2017, the government proposed a green tax on the use of old electronics and appliances as well as stronger penalties for pollution and environmental damage.</p> <p>The government also plans a study on the transition toward a green economy and green businesses to be developed in 2018, starting with the agriculture sector, and will develop a legal framework to support green SMEs by 2025.</p>	Industry	Taxation	Ministry of Ecology and Natural Resources

continued on next page

Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
Strategic Environmental Assessment (SEA) of the National Strategy on the Use of Alternative and Renewable Energy Sources in Azerbaijan (2015–2020) <sup>10</sup>	The pilot SEA conducted in 2014–2016 was funded by the Greening Economies in the European Union’s Eastern Neighbourhood (EaP GREEN Programme). The project results provided inputs to the National Strategy as well as to the capacity building in SEA for government authorities.	Environment	Capacity building and training	Ministry of Ecology and Natural Resources
<b>Bangladesh</b>				
Green ready-made garment (RMG) factories <sup>11</sup>	RMG companies with international green building certification have been granted tax benefits since the fiscal year 2017–2018. Since 2011, 67 RMG factories have received Leadership in Energy and Environmental Design (LEED) certification from the US Green Building Council (USGBC). And 222 more are registered for certification.	Industry	Tax incentives	Ministry of Finance
<b>Bhutan</b>				
Payment for Environmental Services (PES) <sup>12</sup>	<p>Enabling policies: National Forest Policy (2011), Water Act of Bhutan (2011), Bhutan Sustainable Hydropower Development Policy (2008), National Environmental Policy (2006), and National Food Security Strategy Paper (2006).</p> <p>Three PES projects focused on improving water supply and quality improvement have been implemented in the country. These are the Yakpugang PES in Mongar, Namey Nichu PES in Paro, and the Burkhey Watershed PES in Pasakha.</p>	Environment	Policies recognizing PES	Ministry of Agriculture and Forests

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Brunei Darussalam</b>				
Environmental Protection and Management Order (2016) <sup>13</sup>	The order established a policy of implementing environmental audit and imposing penalties on industries that contribute to environmental degradation. Other regulations for environmental impact assessment and air pollution control were drawn up for 2016–2017.	Environment  Pollution control	Policy	Energy and Industry Department
<b>Cambodia</b>				
National Green Growth Roadmap (2009) <sup>14</sup>	The road map promotes environmentally sustainable resource use and encourages the adoption of alternative technologies and methods to support access to <ul style="list-style-type: none"> <li>• water resource management and sanitation;</li> <li>• food security (agriculture) and nonchemical products;</li> <li>• sustainable land use;</li> <li>• renewable energy and energy efficiency;</li> <li>• information and knowledge;</li> <li>• means for better mobility; and</li> <li>• finance and investments.</li> </ul> <p>The road map also targeted high-priority projects for green growth targeted until 2030.</p>	Economy	Policy	Ministry of Environment
<b>Fiji</b>				
National Employment Centre Decree (2009) <sup>15</sup>	The law recognizes environmentally sustainable employment and has set up a trust fund that can be used in part for improving employment in green jobs, green growth, and green productivity in the country.	Industry  Employment	Law	National Employment Centre Board

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
<b>Georgia</b>				
Georgian Green Business Award (2013) <sup>16</sup>	Recognition for green companies, buildings, and products	Industry	Initiative	Ministry of Environment and Natural Resources Protection
National Waste Management Strategy and Action Plan (2015) <sup>17</sup>	<p>The action plan was created with the support of the Greening Economies in the European Union's Eastern Neighbourhood (EaP GREEN) Programme.</p> <p>The project Development of Legislation for Waste Management, part of the implementation of the EU–Georgia Association Agreement, has set the target of achieving a waste prevention and recycling society in Georgia by 2030.</p>	Waste management	Policy	Ministry of Environment and Natural Resources Protection
<b>Hong Kong, China</b>				
Product Eco-responsibility Ordinance (PERO) 2008 <sup>18</sup>	<p>Hong Kong, China's Producer Responsibility Schemes (PRs) require businesses and consumers to share responsibility for the collection, recycling, treatment, and disposal of waste. Initiated in 2008, the PERO serves as the umbrella law for the PRs.</p> <p>Other mandatory PRs are levy on the manufacture and distribution of plastic bags (2009), PRS on glass beverage containers (2016), and PRS on waste electrical and electronic equipment (2017).</p>	Waste management	Polluter-pays principle	Environmental Protection Department

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**Table A8: Continued**

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
Green Finance (2016) <sup>19</sup>	<p data-bbox="461 422 846 831">Transition from “brown” to “green” economy</p> <p data-bbox="461 516 846 831">Hong Kong, China, is taking action on the following components of green finance: funding for green industrial development; green lending; green bonds; green IPOs; establishment of a green rating system; creation of a green stock index; and establishment of a green investor network of listed companies and bond issuers.</p> <p data-bbox="461 869 846 1753">The green finance initiatives—market-driven regulatory and policy developments—include:</p> <ul data-bbox="461 961 846 1753" style="list-style-type: none"> <li data-bbox="461 961 846 1056">• Green bond issuance by wind energy firm Xinjiang Goldwind Science &amp; Technology (2015);</li> <li data-bbox="461 1062 846 1213">• Hang Seng Corporate Sustainability Index Series (2010), monitoring performance against environment, social, and governance (ESG) standards;</li> <li data-bbox="461 1220 846 1276">• Principles for Responsible Investment (2015);</li> <li data-bbox="461 1283 846 1499">• Hong Kong Exchanges and Clearing Limited (2016), which requires ESG-reporting companies to explain their performance against key indicators in the environment sector;</li> <li data-bbox="461 1505 846 1625">• Principles of Responsible Ownership (2015), guiding investors in fulfilling their responsibilities; and</li> <li data-bbox="461 1631 846 1753">• Carbon Footprint Repository (2014), under the Cleaner Production Partnership Programme.</li> </ul>	Industry	Green finance	Financial Services Development Council

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
<b>India</b>				
Carbon Tax (2010) and National Action Plan on Climate Change (2008) <sup>20</sup>	The action plan is focused on renewable energy, energy efficiency, clean technologies, public transport, resource efficiency and tax incentives, and research. The Green India target is restoring 10 million hectares of forests by 2020.	Forestry	Tax	Government of India
Green Innovation Research and Development Incentives <sup>21</sup>	Companies in biotechnology or manufacturing production can receive 200% deduction for in-house R&D expenses. There is also a 100% deduction for revenue expenditure and capital expenditure for companies in the business of scientific research. These deductions are not valid for expenditure on land and buildings.			
<b>Indonesia</b>				
Environmental Protection and Management Law (2009) <sup>22</sup>	Legal basis for payment for ecosystem services (PES) and compensation for environmental services (CES) in Indonesia. Both terms refer to the same schemes (using market-based mechanisms for managing the environment). The law, however, distinctly separates CES and PES with regard to the identity of the institutions involved. The term “CES” indicates a scheme established between the governments (e.g., between two provinces or between a province and the central government), while the term “PES” indicates a scheme established by a private institution (e.g., a scheme between a drinking water company and a community).	Environment	Policy PES	Indonesian Institute for Forest and Environment (RMI)  Local PES guidelines are implemented by local authorities and NGOs (intermediaries), as applicable

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
	<p>Local PES management guidelines established in the Cidanau watershed area in 2007</p> <p>Known as the FKDC Chairman Decree No. 1/SK-FKDC/II/2007, the guidelines were used as reference in the drafting and passage of the national PES regulation and the development of the policy instruments— Law 32/2009 on Environmental Management, Law 37/2014 on Soil and Water Conservation, and Government Regulation 37/2012 on Watershed Management.</p>			
Sustainable Consumption and Production (SCP) Policies <sup>23</sup>	<p>SCP policies encourage consumer demand for environmentally friendly products and waste avoidance. On the supply side, the policies are focused on the social and environmental impact of production.</p> <p>SCP policy instruments in Indonesia:</p> <ul style="list-style-type: none"> <li>• Cleaner Production (2003) (5R initiative: rethink, reuse, recycle, recovery, reduce);</li> <li>• Ekolabel I and II (2003), for products and consumer goods;</li> <li>• PROPER (1989), an environmental rating system targeted at compliance of medium and big companies;</li> <li>• Eco-products directory;</li> <li>• Green Industry Award (2010); and</li> <li>• Mandatory CSR (Company Liability Act 40/2007) for natural resource-based companies.</li> </ul>	Industry Environment	Policy	Ministry of Environment and Forestry

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
<b>Kazakhstan</b>				
Eco-taxes <sup>24</sup>	Environmental taxes (eco-taxes) for “subsurface users” (oil, gas, and mining companies). Regulated by the Tax Code.	Industry	MBI	Government of Kazakhstan
Green Economy Concept (2013) Kazakhstan 2050 <sup>25</sup>	<p>Priorities for transitioning to a “green economy”:</p> <ul style="list-style-type: none"> <li>• increasing efficiency of use and management of natural resources;</li> <li>• modernizing infrastructure;</li> <li>• improving the well-being of the people by easing pressure on the environment; and</li> <li>• improving national security and water security.</li> </ul>	Environment	Initiative	Government of Kazakhstan
<b>Kyrgyz Republic</b>				
Pilot PES scheme in the Chon-Aksuu watershed (2011–2013) <sup>26</sup>	<p>Upstream pasture and forest users identified as sellers, and mushroom pickers and tourists downstream, as buyers of ecosystem services</p> <p>Payment is made through tree planting and soil preparation. Tourists pay environmental fees to gain access to the area.</p> <p>The parties involved: Issyk-Kul Union of Water User Associations, zhayyt (pasture administration) committees, the OPP Temir A; the Mushroom Pickers Association, and the branch office of the Regional Environmental Centre for Central Asia in the Kyrgyz Republic.</p>	Water	Pilot MBI	Donor: Swiss Re Foundation ( <a href="https://www.swissrefoundation.org">https://www.swissrefoundation.org</a> )

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Lao People's Democratic Republic</b>				
Cleaner Production Program (2010) <sup>27</sup>	Cleaner Production Center, set up in 2007, promotes resource efficiency and cleaner production methods in Lao manufacturing through the program, among other initiatives. These methods include waste reduction at source, recycling, and product innovations such as more efficient processes, material substitution, equipment modification, and technology change.	Industry	Organization  Marketing platform  Capacity building and training	Ministry of Industry and Commerce  UNIDO
<b>Malaysia</b>				
Green Technology Financing Scheme (2010) <sup>28</sup>	Government-initiated soft loans available to Malaysian companies that provide products, equipment, or systems that <ul style="list-style-type: none"> <li>• minimize environmental degradation; and</li> <li>• promote a healthy environment.</li> </ul> <p>A total of RM8.5 billion has been allocated for the Green Technology Financing Scheme leading up to 2022.</p>	Water and waste management  Building  Transport	Financing mechanism  Malaysian Green Technology Corporation  Ministry of Energy, Science, Technology, Environment and Climate Change  Ministry of Finance  Bank Negara Malaysia  Credit Guarantee Corporation	
National Green Technology Policy (2009) <sup>29</sup>	The policy is focused on green technology toward sustainable economic development and is centered on the following sectors: <ul style="list-style-type: none"> <li>• environment, for resource conservation and minimized negative impact (water and waste management);</li> <li>• economy, for enhanced national development with the help of green technology; and</li> <li>• social, for a better quality of life for all.</li> </ul>	Environment  Economy  Social	Policy	Ministry of Energy, Science, Technology, Environment and Climate Change

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
<b>Maldives</b>				
Maldives Tourism Green Award (2016) <sup>30</sup>	Formerly called the “President of Maldives Green Resort Award,” this award is presented to sectors that invest in renewable energy and alternative technologies or environmentally sustainable practices.	Ecotourism	Award	Ministry of Tourism
<b>Mongolia</b>				
Green Development Policy (2014) <sup>31</sup>	<p>The intent is to bring about environmentally sustainable development in Mongolia.</p> <p>Green development actions include:</p> <ul style="list-style-type: none"> <li>• Government Resolution No. 303, granting exemption from income taxes for environmentally sustainable equipment;</li> <li>• Government Resolution No. 326, increasing the price of water for production;</li> <li>• Government Resolution No. 327, granting incentives for water savings;</li> <li>• support for wood imports, with exemption from customs tax and VAT; and</li> <li>• transfer tax for environmental protection activities, for local government use.</li> </ul>	Environment	MBI	Ministry of Environment, Green Development and Tourism
<b>Myanmar</b>				
SME Development Law (2015) <sup>32</sup>	Creation of committees to promote SME development. Green financing for SMEs is available through the Central Bank of Myanmar, the Small and Medium Industrial Development Bank, Myanmar Insurance, and international organizations.	Industry	Green financing for SMEs	Ministry of Industry

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
<b>Nepal</b>				
Payment for Ecosystem Services <sup>33</sup>	Although Nepal still has to establish a PES policy, research has been done on potential PES schemes. These include water management for tourism in the Phewa Lake area watershed in western Nepal and PES in Shivapuri Nagarjun National Park, a protected area.	Tourism Environment	PES/Initiative	Department of Forests and Soil Conservation, under Ministry of Forests and Environment
<b>Pakistan</b>				
National Climate Change Policy (2012) <sup>34</sup>	<p>The policy is aimed at mainstreaming climate change in policy sectors such as climate change adaptation in water resources, agriculture, forestry, and disaster preparedness, and socioeconomic measures.</p> <p>The following policies relate to the environment and biodiversity, and to water and waste management:</p> <ul style="list-style-type: none"> <li>• National Environmental Policy (2005);</li> <li>• Environmental Protection Act (1997);</li> <li>• National Conservation Strategy (1992);</li> <li>• National Environmental Action Plan (2001); and</li> <li>• National Drinking Water Policy (2009).</li> </ul>	Climate change	Policy	Ministry of Climate Change

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>People's Republic of China</b>				
Eco-compensation Mechanism and Policies (2006) <sup>35</sup>	Watershed eco-compensation:	Environment	Eco- compensation (similar to PES)/Pilot MBI	Ministry of Ecology and Environment
	<ul style="list-style-type: none"> <li>Government identifies stakeholders and facilitates negotiations for public payments, one-to-one transactions, and compensation in kind; sets policies for compensation, capacity-building programs, and ecological ratings.</li> <li>Beneficiaries get opportunities for sustainable investments, for improved environmental protection with public infrastructure, and for water quality trading.</li> <li>Funding comes from taxes, the Watershed Eco-compensation Fund, preferential credit, foreign sources, and aid programs.</li> </ul>	Water		
	Mineral resources eco-compensation:	Mining	Capital compensation	
	<ul style="list-style-type: none"> <li>abandoned mines reclamation fund, collected by the local government; and</li> <li>abandoned mines ecological restoration fee, collected by the central government.</li> </ul>	Industry	Rehabilitation	
	Forest eco-compensation:	Forest	Fiscal transfer payment	
	<ul style="list-style-type: none"> <li>maintaining and increasing investment in key ecological construction,</li> <li>increasing earmarked funds for eco-conservation,</li> <li>developing multiple financing channels, and</li> <li>establishing a system of ecological taxation.</li> </ul>		Tax reduction	
			Immigrant subsidy	
			Market trading	
			Ecological ratings	

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
	Nature reserve eco-compensation: government buys ecosystem services of nature reserves and develops these for conservation.	Environment	Ecosystem services  Protection cost  Damage and loss	
Green Finance Reform (2015) <sup>36</sup>	Green bonds facilitate investment in environmentally sustainable businesses in the PRC. The proceeds are being used mainly for the following: • clean energy; • clean transport; • energy conservation; • pollution prevention and control; and • resource conservation and recycling.	Environment	Green finance  Policy  Financial incentives  Recognition, rewards, awards	Financial institutions in the PRC
Circular Economy Promotion Law (2009) <sup>37</sup>	The law calls for reducing resource consumption to promote sustainable resource use, and for adopting reuse and recycling measures to produce less waste.  The law features policies related to industrial structure upgrading, cleaner production, comprehensive resource utilization, exploitation and use of resources and energy, and financing mechanisms.	Environment  Industry	Law	National Development and Reform Commission
<b>Philippines</b>				
Green Choice Philippines (2008) <sup>38</sup>	Initiated by the Philippine Center for Environmental Protection and Sustainable Development, Inc. (PCEPSDI), this national eco- labeling program is a voluntary program to initiate change toward environmentally sustainable products.	Manufacturing  Consumer goods	Eco-labeling  Marketing platform  Capacity building and training	PCEPSDI  Development Academy of the Philippines  Department of Trade and Industry  Department of Environment and Natural Resources

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
RA 10771: Philippine Green Jobs Act (2016) <sup>39</sup>	<p>“An Act Promoting the Creation of Green Jobs, Granting Incentives and Appropriating Funds Therefor”</p> <p>The law provides tax incentives for businesses that support green jobs related to preserving or restoring the quality of the environment in the agriculture, industry, and services sectors:</p> <ul style="list-style-type: none"> <li>• special deduction from taxable income equivalent to 50% of total expenses for skills training and research development expenses, which is over and above the allowable ordinary and necessary business deduction for such expenses under the National Internal Revenue Code of 1997, as amended; and</li> <li>• tax- and duty-free importation of capital equipment, that is actually, directly, and exclusively used by the business enterprise for the promotion of green jobs.</li> </ul>	<p>Agriculture</p> <p>Industry</p> <p>Services</p> <p>Environment</p>	<p>Law</p> <p>Tax incentives</p> <p>Fiscal incentives</p>	Department of Labor and Employment
<b>Republic of Korea</b>				
Green Industry <sup>40</sup>	<p>Targets and strategies:</p> <ul style="list-style-type: none"> <li>• greening the industrial sector (iron and steel, chemicals, home appliances, etc.);</li> <li>• developing green-venture SMEs;</li> <li>• building an industrial structure based on resource circulation; and</li> <li>• establishing a green industrial complex and green industry clusters.</li> </ul>	Industry	Support measures	Ministry of Trade, Industry and Energy

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
Green Certification and Financial Instruments (footnote 40)	Green Certification Scheme (2010): <ul style="list-style-type: none"> <li>• green technologies, helping to reduce GHG emissions;</li> <li>• green products, environmentally sustainable products/manufacturing;</li> <li>• green projects, minimizing GHG through energy savings; and</li> <li>• green corporations, companies with one or more green certifications.</li> </ul>	Industry  Energy	Support measures	Ministry of Trade, Industry and Energy
<b>Singapore</b>				
Singapore Green Labelling Scheme (1992) <sup>41</sup>	Endorses environmentally sustainable products. These products are more marketable and accepted by consumers.	Manufacturing  Consumer goods	Eco-labeling  Marketing platform  Corporate social responsibility	Environment Council
Research and Development Grants <sup>42</sup>	Research Incentive Scheme for Companies (RISC): encourages and supports science and technology projects  Training Grant for Companies (TGC): provides training to develop capacity for new technologies, industrial skills, and professional capabilities  Productivity Grant (PG): encourages firm-level projects targeted at increasing energy, water, land, or labor efficiency through operating improvements or technology adoption	Industry	Incentive program	Economic Development Board

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**Table A8: Continued**

<b>Relevant Policy/ Initiative/Legislation</b>	<b>Description</b>	<b>Sector</b>	<b>Type</b>	<b>Implementing Agency</b>
Tax Incentives for Businesses <sup>43</sup>	<p>Pioneer Certificate Incentive (PC) and Development and Expansion Incentive (DEI): encourages companies to expand their businesses in Singapore</p> <p>PC companies are eligible for 5%, and DEI companies for 10%, corporate tax exemption on income derived from qualifying activities, valid for 5 years.</p>	Economy	Research and development tax incentives	Economic Development Board
Finance and Treasury Centre Incentive (2016) <sup>44</sup>	<p>Encourages companies to expand treasury management capabilities in Singapore. Approved companies are eligible for 8% corporate tax exemption on income from qualifying activities, valid for 5 years. Eligible for withholding tax exemption on interest payments, if funds are used for qualifying activities.</p>	Economy	Tax incentives	Economic Development Board
Land Intensification Allowance (LIA) 2017 <sup>45</sup>	<p>Promotes intensification of industrial land use for more land-efficient and higher value-added activities. Targets businesses with large landholdings and low gross plot ratio (GPR).</p> <p>25% initial allowance and 5% annual allowance, up to 100%, on qualifying capital expenditure for the construction/renovation of the building or structure</p>	Industry	Fiscal incentive	Economic Development Board
	<p>Ozone Depleting Substance (ODS) Permit Trading:<sup>46</sup> permits for use and distribution of ODS</p>	Industry	Quantity-based/ Emissions trading	National Environment Agency

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Sri Lanka</b>				
Sri Lanka Eco Tourism Foundation (SLEF) 1998 <sup>47</sup>	Pioneer national ecotourism organization, dedicated to promoting ecotourism in Sri Lanka and to building a strong and professional Ecotourism Network in the Asia and Pacific region	Ecotourism	Organization	Sri Lanka Ecotourism Foundation
Green Building Council of Sri Lanka (2009) <sup>48</sup>	An organization promoting green building and sustainable products in Sri Lanka	Eco-labeling	Organization	Global Ecolabelling Network (GEN)
National Cleaner Production Centre (2002) <sup>49</sup>	Solutions provider started by the Ministry of Industry and Commerce to promote resource-efficient and cleaner production methods	Industry	Organization  Training and capacity building	Ministry of Industry and Commerce
<b>Taipei,China</b>				
Green Trade Promotion Project (2011) <sup>50</sup>	Green Trade Project: A platform for Taipei,China green products, industries, and services  Green Trade Action Plan 2016: a program for enhancing domestic companies' green competitiveness and and helping to promote global participation in green products and services	Industry	Initiative  Capacity building and training	Ministry of Economic Affairs  Bureau of Foreign Trade
<b>Tajikistan</b>				
Savings Book Approach (SBA): participatory reforestation on deserted forest plots in Tajikistan (2010) <sup>51</sup>	Involves the rehabilitation of degraded forest lots by the local population. It generates income for smallholders engaged in lease and contract reforestation.	Forestry	SBA (similar to PES)  Pilot MBI/ Initiative  Joint Forest Management	State Forestry Agency  GIZ

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**Table A8: Continued**

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Thailand</b>				
Bioplastics Investment Incentives (2013) <sup>52</sup>	<p>The Board of Investments provides tax incentives for activities related to the manufacture of eco-friendly chemicals and eco-friendly products.</p> <p>These companies are eligible for</p> <ul style="list-style-type: none"> <li>• exemption from import duties on machinery;</li> <li>• 8-year exemption from corporate income tax, with no cap;</li> <li>• 5-year 50% reduction in transportation, electricity, and water supply costs; and</li> <li>• deduction from net profit of 25% of investment in infrastructure installation and construction costs, in addition to normal depreciation.</li> </ul>	Manufacturing	Tax incentives	<p>Board of Investment</p> <p>National Innovation Agency</p> <p>Thai Bioplastics Industry Association</p>
Thai Green Label (1993) <sup>53</sup>	A seal on products and services that are created through environmentally sustainable methods.	Industry	Eco-labeling	<p>Thailand Environment Institute</p> <p>Thai Industrial Standards Institute</p> <p>Ministry of Industry</p>
<b>Turkmenistan</b>				
Improving Energy Efficiency in the Residential Building Sector of Turkmenistan (2011) <sup>54</sup>	Revised construction and building codes to improve energy efficiency. These energy-efficient housing regulations are expected to provide 250 million cubic meters in gas savings and reduce GHG emissions by 480.3 thousand metric tons of carbon dioxide from 2018 to 2027.	Energy	Policies and standards development	<p>Ministry of Construction and Architecture</p> <p>UNDP</p>

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Table A8: Continued

Relevant Policy/ Initiative/Legislation	Description	Sector	Type	Implementing Agency
<b>Uzbekistan</b>				
Promoting Energy Efficiency in Public Buildings in Uzbekistan (2006–2015) <sup>55</sup>	With UNDP assistance, the government adopted revised building codes including energy efficiency standards. The project built the capacity of national experts and national agencies to apply new building codes and pilot-tested green buildings in the country.	Environment and energy	Policies and standards development  Capacity building	UNDP  GEF  State Committee for Architecture and Construction
<b>Viet Nam</b>				
Law on Environmental Protection (2014) <sup>56</sup>	Includes incentives for environmentally friendly businesses and manufacturers that engage in environmental protection activities, as well as regulations for waste management and control	Environment	Law	Ministry of Natural Resources and Environment
Decision No. 380/QD-TTg  Pilot Policy for Payment for Forest Environmental Services (2008) <sup>57</sup>	Provides the implementing rules and regulations of the Pilot Policy for Payment for Forest Environmental Services in Viet Nam	Environment	Policy	Ministry of Agriculture and Rural Development  Ministry of Planning and Investment  Ministry of Finance  Ministry of Natural Resources and Environment  Ministry of Industry and Trade, and the relevant ministries and agencies

GHG = greenhouse gas, GIZ = German Development Cooperation, SMEs = small and medium enterprises.

Notes:

- <sup>1</sup> Oxford Policy Management. 2014. *Scoping Green Growth Challenges and Opportunities in South Asia Final Report*. <https://www.gov.uk/dfid-research-outputs/scoping-green-growth-challenges-and-opportunities-in-south-asia-final-report>.
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**Table A8: Continued**

Notes (continued):

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- <sup>5</sup> Department of Environment and Climate Change New South Wales. 2007. *BioBanking Biodiversity Banking and Offsets Scheme Overview*. Canberra. <https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/biobanking>.
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- <sup>12</sup> L. Norbu. 2017. *Payment for Environment Services (PES) in Bhutan Current Issues, Approaches and Practices*. <https://www.icimod.org/resource/25981>.
- <sup>13</sup> Energy and Industry Department, Prime Minister's Office, Brunei Darussalam. 2016. *Environmental Protection & Management Order*. <http://www.ei.gov.bn/Shared%20Documents/HSSE/Information%20Sharing/Presentation%20packs/Environmental%20Legislation%20EPMO%20Awareness%20Pack.pdf>.
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## **The Business of Greening**

*Policy Measures for Green Business Development in Asia*

This publication examines the enormous potential for scaling up green business development in Asia and the Pacific. It reviews green markets, technologies, and practices with a focus on developing Asian countries and offers a set of policy options to enable governments and finance institutions to accelerate green business development in the region. Direct command-and-control measures and indirect market-based instruments targeted at both large and small firms are also included. The analysis suggests that advancing green businesses is a win-win for all stakeholders, but requires mobilizing vast resources of private capital and innovative management approaches.

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