Conference Proceedings

Green Business Forum for Asia and the Pacific

Investing in a Sustainable Future

22–24 November 2016 • ADB Headquarters

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Abbreviations

ADB	Asian Development Bank
ANJA	Adaptive Nutrition Joint Achievements
ATM	Automated teller machine
CEO	Chief executive officer
CFO	Chief finance officer
CCICED	China Council for International Cooperation for the Environmental Development
CMO	Chief marketing officer
COO	Chief operating officer
CSO	Civil society organization
CSR	Corporate social responsibility
DEC	Digital Equipment Corporation
EIB	European Investment Bank
EIU	Economist Intelligence Unit
FAO	Food and Agriculture Organization
ICT	Information and communications technology
IFC	International Finance Corporation
IFFS	Integrated Forestry and Farming System
IMF	International Monetary Fund
LEED	Leadership on Engineering and Environment Design
NDRC	National Development and Reform Commission
NGO	Non-government organization
PNG	Papua New Guinea
PBOC	People's Bank of China
PRC	People’s Republic of China
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change
WFP	World Food Programme

Foreword by Daniele Ponzi

The Sustainable Development Goals and Paris Climate Agreement will guide global efforts for sustainable development up to 2030, but success in meeting this transformative new global development imperative will require mobilization of a large amount of resources. Given the limited availability of public sector resources, private sector investment in environmental goods and services is critical for success.

Sixty percent of the world's population lives in Asia; many are fast migrating from rural to urban areas. Several of the world's economic powerhouses are located in the region, generating nearly 40% of global output and contributing 60% to global growth. The region is also grappling with challenging environmental issues, including air pollution, deforestation, land degradation, water pollution, and climate change, which are significantly affecting regional sustainability and putting economic and social development at risk.

The Asian Development Bank's (ADB) first Green Business Forum, a landmark event held last 22 to 24 November 2016 at the ADB Headquarters in Manila, Philippines, affirms that green business development is crucial to achieve environmentally sustainable growth. It places special emphasis on the potential of green business in impacting underserved areas and those suffering from pollution (i.e. water, air and soil), water and land resources degradation, and biodiversity loss. This is a prime opportunity for businesses and private sector investors to be more engaged in sustainable development.

The Green Business Forum brought together over 400 green business practitioners and professionals, financial institutions, government officials from ADB developing member countries, civil society stakeholders, national and international experts, and other stakeholders to share knowledge and identify avenues for promoting green business solutions. The Forum provided a platform for knowledge sharing and learning best practices regarding the policies and incentives, institutional arrangements, and financing modalities that can best support rapid green business development in the region.

Daniele Ponzi
Chief of Environment Thematic Group
Asian Development Bank

Day 1, 22 November 2016

Introduction and Welcoming Remarks

Satinder Bindra, Principal Director for External Relations, ADB

Ma. Carmela D. Locsin, Director General of Sustainable Development and Climate Change Department, ADB

This is the first ever Green Business Forum for Asia and the Pacific, with 500 registered delegates coming from various parts of the world, representing business communities, governments, NGOs, and the diplomatic community.

The forum is being held against the backdrop of the Sustainable Development Goals (SDGs) and the 21st Conference of Parties (COP21) of the United Nations Framework Convention on Climate Change (UNFCCC), where the Paris climate agreement was adopted. Both have resolved to combat the issue of climate change with a great deal of purpose and seriousness.

The responsibility of creating new low carbon, green economies rests not only with policymakers and governments, but also with the private sector. Indeed, the green economy presents opportunities for green businesses to be profitable. This central idea was highlighted in the theme-setting video produced for the Forum, calling for all sectors to "work together."

This first Green Business Forum is enjoying considerable momentum. We have seen the global landscape shift remarkably, with the adoption of the Sustainable Development Goals and the recent ratification of the Paris Agreement on Climate. Environmental sustainability is centrally positioned within the SDG framework.

Businesses are increasingly recognizing that going green is good business, and there has been dramatic growth in the global market for environmental goods and services, which has exceeded $1 trillion in 2015 and is estimated to expand to $1.4 trillion by 2020.

In 2015, Asia's share of this burgeoning market, excluding Japan, was a mere 12%. Given this, the question is "What can we do together?" The hope is that this Forum can provide ideas on how to expand the global market for environmental goods and services to help sustain and restore oceans, forests, and land, and to preserve biodiversity.

Investment needs range from $300 billion to $1 trillion per year, but only a small portion of these needs are being provided. Sizeable investments gaps call for robust and active private investment.

The Forum aims to put the spotlight on emerging yet currently unexplored aspects of green business. It will explore green business opportunities and natural capital ecosystems services to help counter pollution, water and land degradation and the loss of biodiversity. These efforts are key to address poverty, as poverty cannot be eliminated without building resilience to climate change and adopting sustainable land, water, fisheries, and forestry management practices.

Furthermore, the Forum builds on ADB's current efforts to drive environmentally sustainable growth through its investments in renewable energy, energy efficiency, sustainable urban transport infrastructure, and sustainable agriculture. Investments in these areas have expanded dramatically, exceeding $7 billion in 2015.

Through forums like this, exchanges can help stimulate new thinking and cultivate new understanding of the creation, transfer, and deployment of green technology. Such exchange can also help strengthen the foundation for green business development, while helping expand green business partnerships.

As one of the world's most climate-vulnerable regions, and as a growing emitter of greenhouse gases, the Asia Pacific region will need to lead the global fight against climate change and steer climate action.

In order for Asia to lead, we need new ideas and insights. We need to reimagine new business models where growth and nature can intermingle. We need to cultivate a new consciousness about what we can do for our planet. We need to take collective action and create the change that we all want to see, and help secure a sustainable future for us all.

Forum Introduction / Keynote

Daniele Ponzi, Technical Advisor for Environment and Chair of the Environment Thematic Group Committee, ADB

The Introduction to the Forum focused on the meaning of green business, its rationale, status and trends, ADB's support to green business, and the value and potential of ecosystem services.

Though there are varying definitions of "green business", it can be simply defined as "profitable business activity that supports environmentally sustainable growth". There are two types of green business. First, at the core, there are green businesses that provide environmental goods and services. These include traditional and long-established markets such as air and water pollution control, wastewater treatment, waste management, clean energy, monitoring instruments and other equipment, and various consulting services. There are also emerging but still underserved areas. These include the following:

- **Sustainable agriculture and food industry**. The global market for organic food and beverages has reached $105 billion in 2015, compared to $62 billion in 2011, which is a 67% increase in four years. That's a huge jump.
- **Fisheries and aquaculture**. With wide capture fisheries already certified or in the process of being certified, annual catches are about 17% of the total global harvests. And the current demand far outstrips supply.
- **Forestry**. As of 2013, the total area of certified forests worldwide stood at close to 400 million hectares, which is approximately 10% of the global forest resources.
- **Responsible sustainable tourism**. According to the Center for Responsible Travel (CREST), the tourist industry accounted for about $7 trillion of the global GDP in 2015, with sustainable tourism already having a 20% share and continues to grow. This is more than $1 trillion from an industry committed to various levels of greening.

The second type of green business is the numerous companies that have started the journey of going green, from agribusiness to electronics to boutique hotels. The greening of a business can happen at various points in the business cycle – inputs level, process level, output level, and/or marketing. At each of these stages, there are opportunities for the private sector to invest more in green growth.

- At the input level, options include renewable energy, recycled materials, and use of clean procurement systems.
- At the process level, companies can invest in energy and water efficiency, adopt cleaner production systems and methods, and minimize waste generation and pollution streams.
- At the output level, products can be made greener, for example by making products recyclable or by making packaging more eco-friendly. In the case of services, these can be made greener by improving input efficiencies or reducing pollution.
- At the marketing level, the degree of greenness at the other levels can serve as a marketing strategy, especially when combined with green labeling and certification.

- By improving the overall business cycle, and often the entire supply chain, companies can also reduce environmental externalities, such as waste, GHG emissions, and other water and air pollutants.

On the global and regional levels, there is an urgent need for the private sector to invest more in green growth. Currently, there is a huge financing gap for green investment to achieve environmental sustainability. According to a United Nations study, the annual investment requirement for the sustainable development of oceans, forestry, land and agriculture sectors ranges from $300 billion to $1 trillion globally. However, research shows that only 13 to 17% of the funding needs for forest restoration and conservation alone are met, leaving a shortfall of about $250 to $350 billion per year.

While the public sector has an important role to play in achieving the SDGs, its financing is insufficient for it to do so. To fill this gap, there is a need for much bigger investments from the private sector to support green business activity.

The good news is that businesses are increasingly realizing that going green is profitable. Towards this end, they are driven by four factors. The first is the business itself. Companies increasingly see opportunities to invest in process, efficiency improvements, cost reduction, and product quality improvements. The second factor is the market. Companies can go for product differentiation and subsequently gain access to new markets. The third is the government. Companies, armed with the awareness that more stringent regulations will come from the government, already proactively work to improve their environmental performance and respond to environmental subsidies and environmental-related taxes. The fourth and final factor is the financial sector. Instead of serving as a barrier to green business, which was the case in the past, finance is now becoming a key driver of green business, with green financing and green lending becoming more common.

Driven by these factors, the global environmental market grew from about $800 billion in 2006 to about $1.1 trillion in 2015. The Asia Pacific region has enjoyed a higher growth than the rest of the world at about 3.5% per annum from 2006 to 2015, compared to rate of growth of about 2.1% for the rest of the world. The People's Republic of China (PRC) and Southeast Asia saw the highest growth rate, but other regions in Asia are not far behind.

ADB's public and private sector investments in environment, climate change and sustainable infrastructure are creating opportunities for green business, either directly or indirectly. In 2015, investments that contributed to environmental sustainable growth were more than $7 billion, or 42% of ADB total grant and loan operations.

Most of ADB's green investments relate to infrastructure, energy, transport, green cities, and water resource management. Also in 2015, ADB's total climate financing amounted to nearly $3 billion. In the same year, it made a commitment to double its climate finance to $6 billion by 2020, $4 billion of which was to be allocated to climate change mitigation and $2 billion of which was earmarked for adaptation. In addition, in recent years, ADB has also increased its sustainable agribusiness operations. This is an important development in the direction of the new emerging green business area that goes beyond the traditional environmental goods and services.

In addition, ADB supports policy reforms and institutional capacity building for environmental management. This includes support to environmental impacts assessment regulation, environmental standards, and many other examples of policies and procedures. The goal is to effectively integrate the environment in development planning and decision-making. Likewise, ABD's technical assistance for environmental management in the region, which has reached $500 million, and its systematic screening of investment for environmental impacts have supported green business in various ways.

Another important recent development is ADB's Green Bond program. ADB's current outstanding green bonds amount to $1.8 billion, with the first issuance last year at $400 million, and, an additional issuance of $1.3 billion last August. Currently, proceeds from ADB's green bonds are mainly used in energy efficiency, renewable energy, and sustainable transport.

However, it is expected that the scope of ADB's Green Bond program is going to be expanded to other areas of green investment, such as natural resources conservation and ecosystem management. This is consistent with the idea that creating markets for ecosystem services can unlock tremendous green business potential. In 2010, the total value of global ecosystem services was estimated to be about $49 trillion—even larger than total global GDP at the time. This estimate is only indicative but provides an idea about the possible scope of opportunities.

The challenge from a green business development perspective is how to develop markets for these ecosystem services, and convert these values to actual cash flows. Currently, due to market failures, these values are not realized as actual revenue streams. But under proper policy regulatory regimes, these services can be exchanged in new ecosystem markets and these values can be converted to actual cash flows. The private sector could then ensure the continuous supply of ecosystem services on a profitable basis.

Consistent with the points above, there are two important points about this first Green Business Forum. First, the Forum has a special focus on the underserved areas of green business. These are the new emerging areas such as sustainable tourism and organic farming – areas that are growing fast and have high potential for additional future growth. Second, the Forum will be thematic in approach, discussing policy, finance, innovation, across several sectors. This deviates from other similar forums that are more sector-specific.

Opening Plenary: High-Level Roundtable Discussion

Moderator
Sharanjit Leyl, Producer and Presenter, BBC News

Panelists
Takehiko Nakao, President, ADB
Anwar Hossain, Ministry of Environment and Forestry, Bangladesh
Regina Lopez, Secretary, Department of Environment and Natural Resources, Philippines
Erik Solheim, Executive Director, United Nations Environment Programme
Madhu Khanna, Professor in Environmental Economics, University of Illinois
Daniel Spitzer, Chairman and CEO, Mountain Hazelnuts Group

Question #1: *Sharanjit Leyl, who presided over the Opening Plenary of the Forum, started the discussion by asking the members of the panel about green business in Asia. In particular, she asked if they thought the region was well behind the curve and if Asia is conducive to building green businesses.*

For **Madhu Khanna**, the unprecedented agreement in Paris and significant agreements across countries in support of sustainable development, particularly in the developing region, are promising signs for the future. The challenge is how to translate those agreements into actual policies and investments in support of profitable green businesses, including how to level the playing field between business-as-usual approaches and more environmentally-responsible approaches. A combination of technological development and policy targets are needed to move forward.

On the other hand, Minister **Anwar Hossain** noted the dampened mood in the Marrakesh Climate Change Conference (COP22) despite the achievements of COP21 in Paris. He attributed this dour mood to political changes across the globe. Hossain assured the audience, however, that the Bangladesh Government is going ahead with programs that encourage the growth of green business in the country. For example, the Central Bank created a special fund to help private industries finance non-conventional means of generating electricity. To this end, the Government is encouraging households and small industries, including agriculture, to use solar power.

ABD President **Takehiko Nakao** admitted that determining whether Asia is behind other regions in terms of green business is difficult, because rapid changes are happening in the region. However, he said that Asia possesses great potential to support the global agenda of environmental sustainability, which includes concerns about climate change, local pollution, and biodiversity. Because of the region's growing population, more people will rise to middle-income status and will start paying attention to clean air and other environmental issues. As a result, the region will be an important place to foster green business.

Erik Solheim was also not sure if Asia is behind, but he was certain that in the next few years, the region will be ahead. In large part due to PRC, the region is moving much faster than any

other part of the world. He sees that PRC will take a lead in the world stage and also form the core of the transformation of the Asian economies. He outlined what the region should do to address its present-day problems – encourage citizen action, regulate markets, and leave private businesses the means to fund technical solutions. As a final point, he stressed the need for a changed mindset. Instead of viewing environmental protection as a cost, we must view it as an opportunity. We are, after all, more affluent as a result of addressing environmental problems, like cleaning up polluted rivers, solving acid rain, and finding new chemicals for refrigerators to fix the ozone layer.

According to Secretary **Gina Lopez**, Asia has barely scratched the surface of what can be done in green business. Because of the Philippines' ecological diversity and abundance, a lot of opportunities can still be explored for green business. She pointed out that certain measures can help address climate change mitigation and adaptation while also boosting green business. For example, planting a million hectares of mangroves is going to give rise to more seafood, while the mangroves will also help provide protection, as was the case with Typhoon Yolanda. She stressed that measures must be done in a way that the community benefits. If people's quality of life does not improve, they are not going to take care of the resources—they will jeopardize them. Thus, genuine green businesses are those that improve quality of life, has a social entrepreneurial spirit, and maximizes the economic potential of resources in the area.

Daniel Spitzer noted the vastness and diversity of Asia and said that although there is generally strong consciousness and political will, the situation varies from country to country. He brought up the situation in PRC, where there is strong political will at the top and a very well-empowered and authorized Ministry of Environment. There is also a growing middle class and their values about the environment are driving change. However, there are inconsistencies in the implementation at the different levels below. Spitzer is encouraged by positive signs in many countries and is confident that in many sectors, Asia will be leading in product innovation and market development. This is already the case in certain sectors and will happen more and more. However, he cautioned about being "pathologically optimistic," as there is still no genuinely enabling environment. More transparency and sharing across countries and sectors are needed.

Question #2: *As a follow up to the first question, Leyl brought up the experience of the countries represented in the panel – Bangladesh and the Philippines. She asked Mr. Hossain and Ms. Lopez to share more about the policies that their governments are putting in place to help promote green businesses.*

Hossain shared Bangladesh's comprehensive program on climate change, a focus that goes beyond the Ministry of Environment. There are no less than eight national ministries working together on the issue. From streetlights to irrigation, the government is encouraging solar energy, and there are significant efforts to make transport cleaner and more efficient. In terms of creating a conducive environment for green business, he explained that the government does not regulate and only encourages. When the private sector comes up with green business ideas, the government supports them and recognizes their initiative. More environmental awareness is spreading from the top levels of government to the bottom.

In the Philippines, the DENR is shifting from being a mere regulatory agency to a development agency, including a major shift to work more with civil society. Under the DENR, an "area development" approach is being implemented. With a scientific basis and an entrepreneurial

inclination, the approach involves selecting convergence areas, where plans are developed jointly by local government units, the church, academe, and businesses. In the current 29 convergence areas, improvements focus on five performance indicators – happiness, health, environment, peace and order, and the economy. **Lopez** stressed that any approach must be comprehensive, including a focus on values.

Question #3: *Leyl turned to multi-lateral agencies represented on the panel – the United Nations Environment Programme and the Asian Development Bank – to get their views.*

In response, **Solheim** commented on the issue of pollution. With 7 million people dying prematurely because of pollution, and major cities worldwide being adversely affected by it, pollution must be put front and center. Solheim sees pollution as a driver of change because nearly everything that should be done to target pollution will also be helpful for climate change and vice versa. He asserted that UN Environment is doing their utmost to make pollution a key top political level agenda and will launch practical initiatives. He agrees with the World Health Organization that the issue should be addressed from a joint health-environment angle and that resources should be pooled together.

On to the role of ADB, Leyl asked Nakao how high a priority green business development is as an agenda to the Bank, and also asked about the direction of ADB's lending in this sector. **Nakao** expressed his appreciation for the enthusiasm of ADB member-country leaders and ministers to do more for the environment and climate change. In the Philippines, for instance, there was an issuance of a climate bond to finance a geothermal project by the private sector. In this transition, which he considers a fourth industrial revolution, tourism is becoming a major industry, along with agriculture, manufacturing, and services. The focus on environmental sustainability represents a shift from ADB's initial agenda on feeding people. This shift is coming directly from societal needs, and ADB will continue to give its support through finance, knowledge, and policy support.

Question #4: *Leyl then requested Spitzer to share his experience in Mountain Hazelnut, which is also an ADB-supported venture, and his view on how conducive Asia is for setting up green businesses from the perspective of the private sector.*

Spitzer recalled that when they first built a forestry business in PRC, they had a difficult time finding financial partners who understood the opportunities, challenges, and interrelated effects of growing trees in PRC to offset clear cutting in Indonesia, which produced plywood to export to PRC. He expressed his gratitude that the Bank eventually became their partner in Bhutan for his current venture by channeling technical assistance grants to their stakeholders. Spitzer stressed that many places in Asia are still rural, and communities are falling apart because people don't have the ability to make money. There is thus a need to look systematically at these issues and expand green business initiatives to a rural setting.

Question #5: *As the representative from the academe, Professor Khanna was asked how academia can work with the private sector and with multilateral banks to impart knowledge.*

In response, **Khanna** mentioned that there are a number of ways that the academe has been working with businesses, governments, and other agencies. One example is the conduct of fundamental research in new technologies, which typically have high costs of production. Her

research institute at the University of Illinois works closely with British Petroleum to try to develop the next generation of biofuels. These come from grass and other types of biomass that can be grown on low-quality land. The University provided the capabilities of biologists, environmental scientists, and engineers that BP did not have, and also brought an interdisciplinary approach that included social and economic impacts.

Khanna noted, however, that in order to get businesses to be willing to invest in these technologies, there has to be a policy push for it. And in the case of BP, it was the renewable energy commitment by the United States government – that a certain portion of the target 36 billion gallons of biofuels should come from non-food-based crops. This provided the long-term commitment necessary to devote a ten-year research program to help develop the technology.

Another way academia can play a role is to help understand what the required incentives are to make green businesses more profitable. She noted the example of PRC leading the world in ISO certifications, which is being done to gain access to Western markets. Academic work can help to understand these and other drivers and figure out how to take those lessons and apply them more broadly to other regions and sectors.

Question #6: *Leyl then moved on to questions sent through Pigeonhole by the forum participants and audience. The first was, "Do you think we can impose a mandate or mandate laws that push corporations to transform their current businesses to go green?"*

Khanna explained that a number of policies can be used to do so, such as taxes, tax incentives, and regulations that can force or encourage companies to go green. The concern is if such measures can be applied in the developing world, in terms of political will and enforcement capabilities. Khanna proposed a hybrid approach, which would be mandatory but not as punitive. For example, in India, large businesses are mandated to spend 2% of their profits every year on socially responsible projects, like improving the environment, providing education opportunities, improving health services, and so on.

Solheim affirmed the possibility of this being done. However, the environment market does not exist by itself. It exists because governments regulate markets. Hence, governments have enormous impacts on markets. He mentioned the focus of the G20 on green finance and the potential impact of disclosure of environmental criteria, not just financial assets. He also urged that development aid should be used as a leveraging tool to help minimize risk and incentivize business. He mentioned the recent launching of a facility in Jakarta called the Tropical Landscapes Finance Facility, which involved leveraging money from big Hong Kong and Paris-based banks to reach smallholder farmers in Indonesia.

Nakao also stressed the crucial role of governments being able to set visions and goals. Governments can also influence the private sector through, as mentioned, taxing carbon dioxide emissions and removing fuel subsidies. In conjunction with market and social pressure, governments can achieve plenty of things. In Shanghai, for instance, plenty of money was invested to prepare a wastewater treatment facility, but the government also enacted legislation to move factories to more remote locations.

Lopez added the importance of compliance, asserting her belief that people will undertake initiatives because they want to do them and believe in them - and will pursue such initiatives beyond compliance. Here, she said, is "where genius happens." She also stressed the need for education to increase consciousness about these issues.

Question #7: *As a final question for the panel, Leyl shared a Pigeonhole question about how non-government stakeholders, like investors, consumers, and communities, could support efforts at encouraging companies to go green.*

For **Khanna**, education is crucial for this purpose, because people have to know the value of trying to save the environment in order to be motivated to work to save it. In addition, more critical information, including what companies are already doing, should be provided by all companies, not just provided voluntarily. She offered the example of the Union Carbide toxic release in Bhopal in the 1980s. There was such an intense backlash and public criticism that the United States passed a law called the Emergency Planning and Community Right to Know Act. This Act requires all businesses emitting toxic releases to provide information about which chemicals and materials they are emitting and what they are doing about it. She also gave the example of the PROPER program in Indonesia, which provides information about the pollution being generated by the largest pulp and paper companies.

In addition, as a positive counterpart to "naming and shaming," **Solheim** pushed for "naming and faming." There is a need, he said, to give positive recognition to business and political leaders who go in the right direction. He gave the example of Wilmar, the biggest palm oil company in the world. The company started using already degraded land instead of converting peatland. Following Wilmar's lead, every single major palm as well as major pulp and paper companies in Indonesia has promised zero deforestation. This is one example of how the environment has changed in the past few years, with civil society, business, and politics going in the same direction.

Nakao closed the session, asserting the importance of disclosure regulation supported by civil society organizations. In the case of ADB projects, there is a very strict set of policies about environmental impact and social impact. These should be supported by civil society organizations for advocacy and monitoring, and by the media and even the judicial system.

Plenary Session 1: Creating Enabling Policy and Regulatory Frameworks for Green Business

Herath Gunatilake, Director, Environment and Safeguards Division, Sustainable Development and Climate Change Department, ADB

The introduction to the first plenary session, provided by Mr. Gunatilake, focused on enabling policies and regulatory frameworks for green business. As discussed in the previous panel, environmental goods and services don't have markets, unlike cars, clothes, pens, and pencils. The clean air, clean water, biodiversity, all don't have a market. Without creating markets for these services through appropriate policies and regulations, the private sector cannot profitably provide for them.

On the question of "Why markets?", when one looks at other commodities in the market, such as cars and clothes, there are no concerns about short supplies. However, there are huge outcries about polluted air and degraded ecosystems. These outcries are there because markets are not working to help address these issues.

If markets can be created, the private sector would be able to supply ecosystem services without any other pressure, because the private sector's profit incentive, once aligned with the needs of consumers and society, will develop a self-sustaining system. While markets are not perfect, there is no other better alternative.

In terms of policies and regulatory instruments, these can be broken down into three major categories:

- The first type is technology and business standards, which are generally perceived to be inflexible and not business-friendly. However, others believe that rigid regulatory measures can help foster innovation and create competition. Because there is no agreement, it is important to discuss lessons and experiences in applying standards and whether or not they discourage green business.

- The second type is market-based instruments, which are considered to be flexible, efficient, and effective. Examples include green taxes, performance bonuses, and tradable permits. In OECD countries and some advanced countries in Asia, it is thought that these instruments can deliver environmental outcomes with the least cost, and the compliance monitoring costs are low. However, it is important to look at lessons learned and consider if these are replicable in all countries.

- A third layer is new generation policy tools. One prominent example is mitigation banking, which is a success story in the United States. The Clean Air Act of the 1970s and subsequent legislation allowed property developers to mitigate their impact on wetlands by buying credits. The flexible registration allowed private-public entities to provide mitigation measures, and wetland protection became a profitable business. Wetland banking is now a widespread system worth $1.1 to $1.8 billion in 2010. In the process, wetland destruction

has been drastically reduced. Now there is conservation banking, where private landowners are protecting the habitat of endangered species. There is also 90,000 acres of conservation banks in the US, and the concept is spreading to Asia. Australia has already started a similar program for biodiversity offsets. Although successful, these innovative practices cannot simply be replicated in all Asia and Pacific countries. A question for this Forum is whether or not some innovative measures can be tried in the region.

In addition to these three policy layers, it is also important to look at the role of governments in a broader perspective. On one hand, the removal of pervasive subsidies and also pricing the resources at the right level are important measures.

In this region, small and medium enterprises are a very important segment in businesses. While the large corporations are greening their supply chains, how can we somehow build partnerships between these larger corporations and small and medium enterprises? What incentives can governments provide to do that?

Likewise, there are many opportunities for governments to support green business. One example is green procurement, which can have a big effect given the huge amount of public expenditure in the region. If today, all of the governments decided to replace their normal bulbs with energy-efficient bulbs (LED bulbs), then that's a huge impact on green business on one side, and also a huge impact on the environmental side.

Presentation on Policies for Green Business Complementarities and Synergies

Lucy Hurst, Director of the Economist Intelligence Unit (EIU)

The first presentation of Plenary Session 1 showcased the results of some of the research that the EIU has performed on the regulatory environment, and how it frames and incentivizes the green business world, particularly in Asia and the Pacific.

The EIU took a top-down approach in analyzing a range of enabling policies for green growth, from traditional to innovative. The goal was to understand the policies and also to comprehend their strengths and weaknesses in making things happen in a green business world.

Looking at growth pathways, Asia is at a critical juncture. Understanding how policies, regulations and incentives can work together will help unlock the right growth pathways.

In the developed world, having the right policies in place has led to positive outcomes. Countries that have prioritized the environment through policy improvements are now top-ranked and have become green market leaders. A combination of public sector regulations, private sector innovation, and funding channels can open up opportunities.

There are a range of traditional and innovative regulatory structures and incentives that can help drive potential for green business. There are three typologies:

- Command-and-control standards are the first type. These often suffer from weak compliance and monitoring despite a wide scope. Their limited effectiveness is shown in the Yale Environmental Performance Index. The 2016 rankings show that APAC as a whole has a score of 63.07 out of 100. The region is still seen as a laggard in terms of environmental performance. In terms of air quality statistics, in particular, there are some major issues. One-third of the people exposed to unsafe air quality live in the Asia and Pacific Region—that's 1.3 billion people.

- Second are standards that build upon command-and-control approaches, but introduce economic incentives that have a greater potential to unlock economic value and encourage innovations and investments. These instruments encourage innovation and investment that kick-start this next wave of green growth everyone is looking to see. This also gives private stakeholders an arena to find sustainable solutions. A good example is credit guarantees to incentivize investments such as renewable energy.

- Third are voluntary approaches, which include certification schemes, corporate codes of conduct, and disclosure programs. Certification schemes have been key in targeting supply chain problems. For instance, certification in the palm oil industry in Indonesia and other locations, as well as in the seafood industry, has been an important development. There is actually a greater demand than supply of sustainably produced products. Disclosure programs have been key to a lot of greening programs.

EIU has conducted analysis to summarize where countries are along the policy spectrum to create an enabling environment for green business. EIU placed countries into three categories: (1) 'nascent' countries that have minimal policies without momentum towards market-based incentives; (2) 'emerging' countries that are moving into more dynamic incentivization; and (3) 'mature' countries that have programs, systems, and policies in place for many years.

With small and medium enterprises (SMEs), certification programs are important. Large multinationals are likely to enter into arrangements with SMEs if they are certified. As access to finance is also key, governments can step in to provide loan guarantees. Green public procurement is another demand-driver for green products.

Another area studied in the EIU is green finance. The key points here are the use of government funds to leverage private sector investment and the significance of voluntary disclosure guidelines for Environmental, Social, and Governance (ESG) and risks to encourage corporate sustainability reporting.

Yet another area that was scrutinized is green supply chain management (GSCM), mainly in terms of the impact of regulations. While it is burdensome for companies to ensure compliance among their suppliers, GSCM is helping them increase profits through resource optimization and waste reduction, while reducing exposure to reputational risks. ISO Standards have added a level of transparency and verification to the relationship between supplies and buyers.

As for the enabling conditions, establishing sound regulatory frameworks is key, as these provide a clear understanding of what the goals are and why they are such. Also important are: government investment in areas that stimulate the greening of economic sectors; employing taxes and market-based instruments to promote green investment; investing in capacity-building and training; and strengthening governance and political will, which is foundational.

Barriers include weak regulatory frameworks, government oversight, lack of incentives, biased economic instruments, lack of market-based instruments, and non-affinity to the call for action, among others.

A number of initiatives were pointed out across the APEC region. For command-and-control policies, these include South Korea's National Command-and-Control Standards through the Clean Air Conservation Act and PRC's Top 10,000 Program that resulted in 1.2 gigatons of avoided carbon dioxide in 2014. On voluntary approaches, the stock exchanges of Thailand, Singapore, and Vietnam joined the UN Sustainable Stock Exchanges Initiative. For market-based approaches, the PRC, Republic of Korea, and Japan have cap-and-trade systems.

Panel on "Getting the Policies Right: Prioritization Options"

Moderator
Sharanjit Leyl, Producer and Presenter, BBC News

Panelists
Fleming Umiich Sengebau, Minister, Ministry of Natural Resources, Environment and Tourism, Republic of Palau
Karlo Alexei Nograles, Representative, First District, Davao City, Philippines
Oyun Sanjaasuren, Chair, Global Water Partnership; formerly Environment and Green Development Minister of Mongolia
Mark Laska, Founder and President, Great Ecology; Managing Partner, Tellurium Partners
Sonomi Tanaka, Technical Advisor (Gender), ADB
Herath Gunatilake, Director, Environment and Safeguards Division, Sustainable Development and Climate Change Department, ADB

Question # 1: *After introducing the panelists, Leyl requested them to describe what they and their respective organizations are doing to support the regulatory environment in this region.*

As a mitigation banker, **Mark Laska** shared how from less than 200 mitigation banks in the United States, there are now 3,000 mitigation banks that have about $1.5 billion in credit sales and employ over 250,000 people. He expressed his desire to bring up "vital ingredients" that have made mitigation banking a successful program in the United States and also wanted to discuss whether they could be applied in the region.

Oyun Sanjaasuren discussed the Green Development Strategy in Mongolia, which she led as Environment and Green Development Minister. It has since been upgraded to the Sustainable Development Vision 2034. It contains clear targets and a legislative framework. She also pointed out that 65 countries around the world are working on green economy-related strategies and action plans, and more than 90 countries have listed forms of fiscal policy reforms in delivering their Intended Nationally Determined Contributions (INDCs).

Sonomi Tanaka expressed her assurance that that ADB's own investments will benefit gender equality and contribute to women's economic, social, and political environment. As such, she pointed out that green economy and green business have been present for quite some time, but

are relatively new in terms of gender perspective. A good start for her is aggregating according to gender the employees involved in the green economy's value chain. With this data, it would be possible to determine the extent of opportunities for women in this sector.

Karlo Alexei Nograles discussed recent legislation enacted by Philippine Congress. These include the Climate Change Act, the Ecological Solid Waste Management Act, Renewable Energy Act, and the Clean Air Act, among others. The 2016 Philippine Green Jobs Act provides for specific incentives, like a special deduction from taxable income equivalent to 50% of total expenses for skills training and research development expenses. There is also a duty-free importation of equipment that will be used in the promotion of green jobs.

Fleming Umiich Sengebau presented about Palau's initiatives in the tuna industry. Initiatives include electronic monitoring of all long-line boats and promoting a green brand of tuna, among others.

Herath Gunatilake explained that his position as Director for ADB's Environment and Safeguards Division has two components. First, he is responsible for ADB's safeguards to ensure ADB projects do no harm to the environment or communities. Second, he serves in the Knowledge Department of ADB, which involves generating, filtering, and sharing knowledge to influence the Bank's entire development program. In the latter role, he pointed to recent efforts to convince governments to borrow more in the area of natural capital, not just for power plants, roads, and water projects. Another ADB project, which is helping support this Forum, is supporting ways to enhance the role of the private sector in managing the environment.

Question #2: *Leyl asked the panelists to share their views on the policies and regulations that are required to enable green business opportunities and how to address governance and transparency issues.*

Laska shared four ingredients that led to the success of the mitigation banking concept: the confluence of strong and consistent federal, state, and local regulations that are protective of habitat and are applied to projects no matter their size; strong regulatory consulting and legal systems that promote and enable compliance with regulations; an engaged private sector that is willing and able to invest in mitigation banks; and, stakeholder and NGO communities that will put pressure on developers, regulators and mitigation bankers.

Tanaka talked about the gender situation within the labor market. She revealed that in developing Asia, only 49% of women participate in the labor force, compared with 80% of men, and they are also concentrated in lower-paying and precarious jobs. Their access to finance is also limited, which limits their opportunity to start businesses. Though green jobs could not solve these issues, they would certainly provide new opportunities. However, gender constraints would need to be addressed moving forward in the political environment. These include education and skills such as technical vocation education, legal barriers such as maternity leave and access to productive resources, and access to finance such as quotas earmarked for women-led small enterprises.

For the Philippines, **Nograles** added a number of plans and steps that the country has undertaken. These include the National Climate Change Action Plan, which draws out the climate change action plan for 2011–2028. Part of that action plan includes the creation or promotion of climate change, climate-smart industries and technologies, through the creation of green jobs. The Department of Labor and Employment (DOLE) went into a green jobs mapping to find out the sort of green jobs that can be created or are already available in the country and focused on

several industries. As a result, DOLE was been able to also map out not only the green jobs that are available in the country, but also the policy frameworks in each of these industries.

Zeroing on tourism, **Sengebau** shared Palau's laws that are meant to protect wildlife in the country. For instance, Palau created a shark sanctuary in 2009. Sengebau shared that one shark can contribute $1.9 million to Palau's economy over its lifespan. This amount comes in through shark diving expeditions. He also described the Protected Areas Program, which is funded through green fees paid by tourists. There is also a separate charge for swimming among jellyfish in a particular lake, and part of those funds is used to protect water resources. Also, Palau's President is pushing for stricter measures for incoming investors, such as requirements for hotels to provide their own water treatment facilities. As the President is fond of saying, "our environment is our economy, and our economy is our environment."

Sanjaasuren gave concrete examples from Mongolia. On renewable energy, Mongolia instituted hidden tariffs, power purchase agreements and all sorts of incentives to deliberately give renewable energy a competitive advantage. As a result, five or six companies are negotiating and signing a power purchasing agreement for solar and wind projects in Mongolia. On water, Sanjaasuren stressed that water has to be priced, but not as a normal market commodity. When she was Minister for Environment, water tariffs were increased for industries. Tariffs were doubled or quadrupled depending on whether the area is water-scarce or water-abundant. Ecosystem services payments were also introduced. One hundred percent of the revenues from these went to local villages and provinces, and at least 55% had to be spent on ecosystems services, such as protecting forests and water resources and environmental rehabilitation.

For Sri Lanka, **Gunatilake** offered some good examples. These include tax concessions on hybrid vehicles and electrical vehicles. These cars are taxed by 180%, while gas-powered cars are taxed by 200%. The price margin provides extra incentive to buyers, who also benefit from lower fuel and maintenance costs. As a result, 40% of the small vehicle fleet in the country was mainly hybrid, and electric came later. Gunatilake also highlighted the importance of political will in pricing resources to levels that will allow services to improve. The Sri Lanka government was able to overcome societal pressure to increase water pricing to allow close to cost recovery. After introducing this to a small part of Colombo, water wastage was reduced by about 50% within six months.

Question #3: *Leyl asked panelists about the developed country experience, particularly about lessons that can be applied in developing Asian countries.*

In response, **Laska** highlighted the importance of a strong court system that will ensure enforcement of regulations. In the United States, the regulatory system is robust and much of its success comes from the fear of litigation. These things, along with stakeholder pressure and willingness to comply with regulations, are important elements.

He also stressed the need for very specific regulations. For instance, mitigation banking credits are closely determined based on impacts of a development project, so they can be considered ecosystem service payments. This requires a formula that can be replicated by a lot of practitioners. For mitigation banking, technology is also important, as degraded habitat can be returned to improved function through innovation.

To this, **Sanjaasuren** stated that solutions must be holistic and integrated. He gave the example of food waste. As much as a third of all the food in the world is wasted, and one-fourth of all the water used for agriculture is lost along with the food loss. Given that 70% of fresh water is used

for agriculture, companies that address food loss are also helping to solve water security. Sanjaasuren gave the example of Tesco, which is working through their supply chain to reduce food loss and waste.

Gunatilake shared some "low-hanging fruits" that ADB wants to focus on in the next three to five years. One is that when ADB does a public or private sector project, ecosystem services can be integrated into the design and implementation. For instance, for a hydropower project, 1% of the hydropower revenue can be used to maintain the watershed, which is important given the siltation problems with dam projects. Such an approach is much easier than implementing a stand-alone ecosystem services project. Other examples are cleaning up lakes and rivers as part of water supply projects, and restoring wetlands as part of urban projects, which can help reduce floods. The next step is to encourage the private sector to pay for ecosystem services, such as water companies that rely on good watershed management. These approaches provide avenues to "inject green" while investing in the private or public sector.

Question #4: *With the number and variety of issues raised by the panel, Leyl asked the panel members how they would prioritize these issues if they were a top-level government official.*

Sanjaasuren suggested that the focus should be on "leverage points", which are strategic places where small changes could spark big changes in the system. The emphasis here is on capacity building on how to approach, design, and screen projects.

Nograles, as a former Congress Chair for the Committee on Labor and Employment, stated that he would focus on creating jobs and finding ways to give jobs to Filipinos while also protecting the environment. He pointed to his authorship of the Green Jobs Law, which mandates certain actions by agencies in charge of labor, education, certification, and business facilitation (for MSMEs), among others. The other part involves incentivizing the private sector to help with training workers and to import equipment or develop green technologies.

Gunatilake commented that one of the problems of prioritizing is that organizations are often compartmentalized into sectors, like energy, transport, urban, and agriculture. If issues are rather approached thematically, sometimes without needing to prioritize, more issues can be covered in a holistic way. For example, to help solve the problem of air pollution in PRC, ADB first provided a policy-based loan to help create an enabling environment, followed by a private sector loan to invest in air quality improvement. The result is action across all sectors, including energy, transport, and industries.

Laska stated that market forces help to prioritize. In Palau, for instance, the importance of ecotourism led the country to prioritize tuna, coral reefs, and diving experiences. In the United States, wetlands are prioritized because when they are preserved, there is habitat there. They produce fish and birds. They are valuable for flood control. From there, other credit trading system arose such as water quality trading and storm water conservation, and specific species credit trading. So the market has really directed what are the critical factors to prioritize. Governments of course help direct, but the market has taken over in the US.

Tanaka stressed that gender equality cannot be dropped. Underscoring Sanjaasuren's point, she believes that we need to find "trigger points" that are the most transformational. Without addressing gender equality, we cannot achieve sustainability.

Question #5: *Going to questions posted on Pigeonhole, Leyl shared a question about how small and medium enterprise can help facilitate green business in rural areas. How do small, family-owned businesses think about going green when their main concern is just to make ends meet?*

Sengebau suggested providing tax incentives. He presented the example of how Palau became stricter with requirements for new businesses such as hotels, but also provided them with tax relief for the next 10 years. This is helping development spread to the rural areas.

Tanaka stated her belief that women have a lot of opportunities in rural areas as part of the green business movement. This is because women already have significant presence in producing food and conserving water and other natural resources. Women could convert what they are doing - sometimes unpaid - into a more skilled area they could profit from.

Question #6: *From Pigeonhole, Leyl shared a question about policies that could make polluters pay for mitigation. Since most Asian countries do not charge much for waste disposal, how can this be changed?*

In response, **Laska**, talked about a United States policy, the Oil Pollution Act. This act put great pressure on companies that transport oil. In the recent spill in the Gulf of Mexico, BP was made responsible for two different types of penalties. The first was remediation or the clean-up. The second was to cover the natural resources that were damaged. The latter amount, which was about $8 or $9 billion, goes into projects that support habitat preservation and restoration.

Question #7: *As a final question, Leyl asked what structure might allow and encourage harmonization of environmental regulations across Asia, given the fragmentation of approaches?*

Nograles mentioned the ASEAN Economic Community 2025 Blueprint, which defines the goal and vision for sustainable economic development in the region. Within this community, members are left to police their own ranks, but this forum provides an opportunity for laws and regulations to be harmonized.

Gunatilake shared that ADB has supported harmonization through regional cooperation programs, such as the Greater Mekong Subregion Program. This program successfully harmonized the environmental regulations of those countries. The focus was on pollution, since industries can shift to countries with less stringent regulations. Similar efforts are now underway in Central Asia and South Asia.

Question #8: *To close the session, Leyl requested all the panel members to provide a quick summary of how they imagine green business will fare in the Asia Pacific region ten years from now.*

Laska foresaw spectacular growth in the region once they recognize how to import various green businesses and start them up locally.

Sanjaasuren was optimistic, citing the example of Asia's lead place in renewable energy. However, he noted that mindset of people and businesses, along with government policies, need to change. A paradigm shift is needed. This is not going to happen automatically.

Tanaka was likewise hopeful as she has already seen a lot of good changes in regard to gender equality.

Nograles said that we're in a good time in history given that Asia is the focus right now. This provides an opportunity to grow responsibly and sustainably. The learnings from developed countries will be helpful to the region as it moves towards more sustainable growth.

Sengebau is also optimistic, as people are becoming more and more aware that their livelihoods are at stake.

Gunatilake's optimism is partially based on changing perceptions within the ADB. Compared to ten years ago, there is more interest, even at the level of the Bank's President, in supporting private sector participation in environmental management. In 5 or 10 years, he is certain that the Asian region will be leading in green business.

Plenary Session 2: Mobilizing Private Sector Finance

Moderator
Sharanjit Leyl, Producer and Presenter, BBC News

"Power Talk" Presenter
Paul Tregidgo, Managing Director for Global Markets Division, Credit Suisse, and Vice Chairman, Debt Capital Markets

The session started with a one-on-one interview-style power talk, which focused on attracting investments in areas such as natural capital conservation, along with agricultural commodities and other environmental goods and service.

Paul Tregidgo joined panelists in the earlier session in voicing his optimism. Over the past 30 years, he has seen the interface between investors, borrowers, and users of capital markets. He noted that the capital markets have become a force for good, from asset-based markets, mortgage-based markets, and in particular, emerging markets, where he has worked since 1991. For instance, the size of the emerging debt capital markets is $400 to $500 billion per year. This is a far cry from when he first started visiting Argentina, when people were questioning the availability of the bond market, along with legal and disclosure issues.

Question #1: *Leyl started the interview by asking about the huge obstacles and risks that are keeping private sector capital on the sidelines. How can he be optimistic given these obstacles?*

Focusing on the scale of the need, Tregidgo pointed to an estimate from Moody's. Over the next 12 years, they estimate that between $50-90 billion dollars are needed in this space. In comparison, the international and global bond markets have a total value of $90 to $100 trillion dollars. Yet, demonstrable resources at work in the region are only 1% of that amount.

Given that there is an identified need and the impetus to make it a reality, Tregidgo voiced his optimism in the markets. "The markets have done it before, and they'll be able to do it again."

Question #2: *Before asking about green bonds and other financing instruments, Leyl asked about natural capital. In particular, how can a value be placed on ecosystem services like fresh water and forest products?*

Tregidgo stated that one of the barriers to developing this market is, perversely, a lack of investable supply. Investable supply means instruments that are available at scale, with liquidity. Equally, these instruments must be backed by data, so there are metrics available against which relative comparisons can be made.

So, indeed, one of the biggest challenges is to value natural capital in a way that provides investable supply. It is very difficult to value the natural capital in a river or in a forest. On the other hand, one wrong way to do it is not to value these things at all.
There are many emerging tools, such as data analytics, predictive analytics, data mining, digital wallets, mobile satellite technology, in addition to social media and the cloud. We have these tools together with the need, together with the demonstrated appetite—to take these flaws and transform them into products.

Question #3: *Turning to financial instruments, Leyl asked about the type of financing instruments that could attract significant and new sources of private sector capital.*

Tregidgo first spoke about the pre-conditions needed for green finance to flourish. These include global agreements, such as those reached in Paris (COP21) and the G20 Initiative, along with subsequent green bond study led by PRC and the Bank of England.

He also pointed to the Task Force on Climate-related Financial Disclosures, which is led by Michael Bloomberg under the Financial Stability Board. The task force was set up to introduce a way for corporations to disclose data on the ways their business models are affected, so that consistent and accurate pricing and distribution of risks is available and the likelihood of large and unexpected changes in asset values is disclosed. And, perhaps last but certainly not the least, to force boardroom disclosure.

Equally, in the development of new products, investors have a voice and perhaps have been more vocal than many intermediaries. Particularly around climate change, huge cohorts of investors are commanding billions of dollars' worth of assets under management, calling for policymakers and the regulators to put in place a regime where they can put money to work.

On the back of that, banks have put billions of dollars' worth of commitments on the table, or at least in standard terms, the intent. The millennial generation is partly driving this, as they are more apt to consider their values when investing. Thus, it is important for financial intermediaries to pay attention in engaging their client base.

Question #4: *Leyl then asked specifically about recent developments with green bonds, citing a news item that emerged in February concerning Apple's upcoming issuance of a massive green bond, worth a total of $1.5 billion. This raises the question of risks for big firms like Apple in willingly taking on such debt to fund green initiatives.*

Tregidgo noted that, at the moment, green bonds tend to be plain vanilla bond issues with a demonstrated use of proceeds. They may not yet be changing the cost of capital or altering behavior across the board. They may not yet have strict definitions about what constitutes "green". But those undertaking such initiatives are sowing the seeds for a massive change in awareness and education of the investor base.

This group includes the lay person, the retail investor, and the institutional investor. Investors are frankly waiting to be told by their domestic or international regulators that they can invest in green and it is not in breach of their fiduciary duty and that they should take into account green NSG factors in their credit analysis. Those days are coming, and in some cases (like in some of the stock exchanges), they are already here.

Tregidgo fails to see the risk, but rather sees a cost, which he explained as follows. If you are the treasurer of a for-profit corporation, you are concerned about "basis points" – getting the best possible price for your bond with the least possible cost. For green bonds, the jury is out on whether you will get best pricing today. Although they do not have an additional liability cost (because corporations are always tied to their corporate disclosure), green bonds do have an additional financing cost. They need different opinions, close monitoring of proceeds, and compliance with certain requirements, which are voluntary at this stage. Tregidgo mentioned Apple's issuance of green bonds, noting that green bonds were trading, but that the trading was "tighter" than the other tranches.

Another important topic is the role of hosts – other multilaterals and other governments. Going back to the emerging market analogy, that market acquired some heft when the sovereigns led the way. In the eyes of investors, the sovereign provides a benchmark, both in terms of price and disclosure. In terms of leading the market forward, Tregidgo believes sovereigns need to lead the way in the green bond market.

With that said, Tregidgo stated that he believes multilaterals like ADB and EIB are doing a good job in going where some corporate treasurers fear to trade, by using their reputations and vast quantity of financing to champion the green bond or climate awareness bond concept. Here, there is still a lot of work to do in fully engaging and catalyzing a market.

Question #5: *Noting that emerging markets drive a lot of the economy in rural areas, Leyl asked what financial products can help small and medium enterprises.*

From his experiences with ACCION International and Venture Lab, Tregidgo knows that SMEs' biggest issue is in finance – cash flow and the ability to deliver products. The major capital markets are not a natural place for SMEs to go without some form of securitization and aggregation, which are techniques that can help large scale capital markets engage with SMEs. In addition, he noted that there are a lot of under-the-radar technology-based activities that are addressing payment systems.

Question #6: *Turning to questions on Pigeonhole, Leyl shared a question about how mobile technology and also microfinance can help promote green enterprises in the region.*

Tregidgo used the example of pay-as-you-use solar systems developed in Africa through institutions like M-KOPA, which was developed on the back of the mobile wallet technology of M-Peso. For Tregidgo, when a person on his phone can obtain enough data to have a very good handle on what's being produced where and when, this can be harnessed to help value natural resources. Through mobile technology, solutions can be found around data, analytics, and monetizable flows.

Question #7: *The interview moved onto the topic of youth participation. If millennials are indeed motivated by values, as discussed previously, what can they do?*

Although most millennials are not yet in a position to be in investing yet, Tregidgo believes that today's youth are going to vote with their cash – by deciding where they are going to put their investable dollars. For Tregidgo, it begins with the generation that is coming through.

Panel on "Upscaling Green Business in Asia-Pacific through Private Sector Finance"

Moderator
Michael Barrow, Director General, Private Sector Department, ADB

Panelists
Atiur Rahman, Professor, Department of Development Studies, University of Dhaka

Christopher Knowles, Head of Climate Change and Environment Division, European Investment Bank
Assaad Razzouk, Group CEO, Sindicatum Sustainable Resources
Mahua Acharya, Assistant Director-General and Head of Investment and Policy Solutions, Global Green Growth Institute
Dipal Chandra Barua, Founder, Bright Green Energy Foundation
Arun Agrawal, Group President, International Banking and MNC Corporate Banking, YES Bank

Michael Barrow introduced the panel members, who came from different sectors – government, central banks, multilaterals, and private banks and investors. Barrow explained that upscaling financing for private green businesses will require major combined efforts. The opportunity is enormous, but there are also challenges.

Question #1: *Barrow asked each panelist to share, based on his or her individual perspective, about what needs to be done to upscale green business in the region through private sector finance.*

Atiur Rahman, as the former Governor of the Central Bank of Bangladesh, stressed that there are 101 things that can be done. Through an incremental process and small kinds of fiscal incentives, a lot can be accomplished. He called on everyone to make best use of the banks, as they are close to investors and entrepreneurs. They can screen companies that are viable ("green"), nonviable ("red"), at risk ("orange"), and can also be called upon to show how to stop companies from going to red.

Banks can also help the regulators at the Central Banks to give the right information, which is important since Central Banks can work as policy advisors to the government. In his view, Central Banks in the region are not playing enough of a development role. In his case, Rahman took the money to the peripheries, and Bangladesh now has a food surplus.

Rahman explained that to get banks thinking long-term (one of the challenges of green banking), the Central Bank first installed the ethos that banks should care for the real economy and promote corporate social responsibility. They then provided incentives for companies to green their operations through favorable refinancing terms. Although the money was small, this helped leverage more money. This is especially important in textiles, which is a leading industry in Bangladesh. He also noted that in the last 7 years or so, 33% of the total credit has gone to small and medium enterprise and also to agriculture. More than 300,000 families of sharecroppers received money and 65% of them are women.

Christopher Knowles noted that EIB is, in a modest way, a multilateral leader in this space. EIB has provided around $100 billion for climate finance in the past five years, including around $22 billion last year alone. Those are big numbers, but just a drop in the bucket of what is needed. The EIB and ADB cannot hope to fill the bucket, as only the private sector can mobilize the needed capital.

To that end, there is a need to turn to capital markets. Knowles explained that there are various ways of accessing capital markets that involve using what little public capital is available to leverage flows from the capital markets, to de-risk and drive forward new business models when necessary, and to provide some credit enhancement to make capital flow from the capital

markets. Some $90 to $100 trillion is there in international bond markets, of which only less than 1% is being used for the climate agenda.

However, Knowles also stressed the value of doing some smaller scale, high-impact initiatives. There are some pieces of this agenda that are not well formulated. Renewable energy is quite developed, but the natural capital part of the agenda is less developed. In that particular space, a lot more effort must be spent working on higher impact and smaller scale things.

To close, Knowles explained a couple of pre-conditions. The first is government leadership to provide investors with certainty and stability. That comes from having a clear government policy or roadmap of where the government wants investment to take place in 15 or 20 years, with an explicit statement of what measures the government is going to take to support that investment. The second condition is financial sector regulation. He believes there is a need to encourage or even mandate banks, insurance companies, and pension funds a reallocation of resources to the climate space.

Assaad Razzouk, a CEO and formally the Chairman of the Association of Sustainable and Responsible Investment in Asia, voiced his opinion that governments and development finance institutions are doing everything they can do and sometimes even more.

In his view, it is the private sector and the markets that are doing almost nothing. He explained that the private sector has just two parts: businesses and investors. There are 50,000 listed businesses, almost none of which are doing much about the green agenda. The millions of SMEs are maybe even further removed. However, the listed companies have a boss—the capital markets, a $150 trillion monster.

To simplify the enormity of the capital markets, Razzouk introduced the concept of “pajama guys”. They get up in the morning in their pajamas, most likely in New York, and start effectively shorting or selling options or writing inputs or calls or dabbling in the foreign exchange market or the interest rate market, and pricing things left, right, and center. These guys don’t ask anybody what risk premium they should put on investing in India or investing in this sector or pricing this management team. However, when it comes to climate and green, they hide behind a wall of concepts and, most importantly, a total focus on short-term profits.

To upscale, these pajama guys must be reached, and for them to be reached, they will have to lose money. For them to lose money, it must be made very expensive for investment banks to make coal companies public or to raise money for offshore oil and gas exploration. That is what investment banks are doing and that is how they are making money now. To make it expensive, one of two things is needed: either legal lawsuit so that the concept of fiduciary duty clearly covers climate risks, or—and that is a less optimistic outcome—a price on carbon. Meanwhile, citizens have to do something at this point.

Mahua Acharya, as someone who sits in the middle looking at how to put together products and getting the right conditions for green financing, the biggest challenge in upscaling is the lack of deal flow. There is no investable supply. Governments struggle to figure out how to shape investments that will bring in private capital even though the ambitions are very clear. There are businesses that were willing to go the distance and spend the money on clean technology, but there is no regulatory certainty. Especially in the discussions around mergers and acquisitions, unless you have at least a 10-year regulatory certainty, no business is going to take this seriously.

In her role, Mahua roams around between investors, private investors, public investors, and small

developers, because the Global Green Growth Institute works in countries that have small businesses that are disaggregated like off-grid power supply. In these countries, something has to happen in that middle space between project developers, who say “show me the money”, and financial institutions, which say “show me the projects”. Deal supply is about business models. There are not enough business models out there, and the few that are there are just not of scale enough to bring in the trillions that are sitting with institutional investors right now.

Dipal Chandra Barua brings a businessman’s perspective, particularly focused on SMEs and microfinance. He described his foundation’s efforts to promote solar home systems in Bangladesh, which has become a model for developing innovative mechanisms to spread green business and finance to the poor.

When they were first starting up, they needed to find a way to help people purchase their 17-20 watt systems, which are worth at least $300. The goal was to replace kerosene as a lighting option, and rising kerosene prices helped their cause. They started in a small way, giving six month loans to middle income people, such as school teachers, government employees, and richer farmers. They received assistance from USAID and others. In 2004, they really started scaling up with assistance from the World Bank, which launched a nationwide solar home system program.

With the World Bank, they fought to install a sustainable model, rather than just providing grant funds. They started offering financing for three years, involving 36 installments. It took a long time for them to scale up – ten years for 10,000 systems – but after the finance system was set, everything took off, even growing as fast as 10,000 in one day. Finally, the Infrastructure Development Company Limited (IDCOL) came in, with help mainly from the World Bank. Now, 4.5 million systems, or 15% of households, have been installed. As a next phase, they started a solar irrigation farm, with the goal of replacing diesel engines.

The challenge now is to provide 100% electricity in rural areas, and here again, the challenge is financing. Barua stressed that interest rates are still high (IDCOL is charging a 9% interest rate). If there is no soft financing, he warned, then it will be very expensive like any other commercial loan. Another challenge is collecting money, which they are solving through mobile technology. By early next year, he hopes all the systems will be prepaid metering systems that are flexible. They also aim to promote a solar energy grid system, supported by net metering initiatives.

Arun Agrawal, President of YES Bank, explained that since the inception of the bank 12 years ago, they have been focused on sustainable finance. In fact, they were among the earliest banks to build environmental sustainability guidelines into their credit efficiency, without a mandate to do so.

Agrawal explained that, because of the drop in solar prices and a strong government commitment to renewable energy in India, the renewables industry has developed quite actively and they became a leader in terms of financing. When the green bond principles came out in 2014, along with regulatory changes that permitted banks to raise long-term bonds, they saw an opportunity.

In February 2015, they opened the green bond market in India with a small $150 million issue, and since then, they have done two more issuances. Over the past three months, $2.7 billion of green financing has already happened in the country, and this market will continue to grow. In addition to raising their own green finance, they have also helped their clients raise green bonds in the market. They have also worked with SMEs to help green them.

Agrawal said that lending to green projects was always a commercial decision, even without any subsidy. They did not do it for charity, but instead saw it as an upcoming industry. This was true even though it costs up to 30 business points more than it costs through conventional funding because of the insurance, monitoring, and reporting costs. They viewed green projects as a logical step, even though it was a little more expensive.

Question #2: *After the panelists shared their individual perspectives, Barrow asked the panelists if they have been able to make money from green finance.*

Knowles noted how people are starting to see the industry as a growth area. Ten years ago, he gave up a role where he was lending $5 billion a year for project finance around Europe. In the first year at EIB, he did $110 million. But as it went on, there has been an evolution, which has partly been generational. There are a lot of younger people coming through who want to do work aligned with their values. People are seeing it as an area where interesting careers can be made. He now has a team of 30 people, who are among the best people at EIB because they clamor to be in this department.

Question #3: *Picking up on the earlier discussion, the panel was asked to elaborate on the need for government subsidies and other support to help drive down risks and costs in order to make green business viable.*

Rahman affirmed the need for public finance in the form of financial support, as well as smart subsidies through the government. The Central Bank of Bangladesh continues to offer financial support through a refinance line. The Central Bank provided the refinance to the banks, and the banks then lend to the supporters. The risk is thus on the banks, and they take it to the users.

In Bangladesh, there is a yearly quota – 5% of the total credit must go for green financing directed towards a good cause. Due diligence is encouraged for indirect financing, and that's really pushed the banks. The Central Bank also provide positive encouragement. For example, banks that do very well in green financing are listed on the website of the Central Bank, so greening becomes part of their brand.

However, Rahman stressed that the capital markets are vital to really go bigger and greener. And for that, disclosure and information is badly needed. He suggested a focus on positive reporting, rather than simply negative. Insurance is an important area, because it has long-term funds and can help with larger green investments.

Question #4: *Barrow asked about minimum concessionality, where the key thing is making sure that leveraging is maximized using smartly bought public money, and how it can be done.*

Acharya first explained that there is no single homogenous entity like "private sector finance." The starting point is first understanding who to talk to on the investor side. The early investors are looking at perhaps shorter-term returns, wanting to exit in three to five years. They tend to invest in smaller type businesses. Then there are institutional investors who are the large ones, and they are reached through the capital markets. They are willing to take lower returns, but they want longer-term certainty.

The target investor can help determine the use of public capital to fill gaps. Some can be used to reduce risk and some can be used to enhance returns. For the latter, it's very important that the "pajama guys" (mentioned earlier) can make money from green investing.

As a second main point, Acharya also stressed that both private and public capital should come out of their comfort zones just a little bit in terms of creativity and innovation. Public money should be used where there is the highest point of leverage.

Question #5: *Barrow next asked about the "pajama guys", specifically about whether they really get it and can be persuaded to invest responsibly.*

Razzouk shared that the pajama guys mainly do not care, and that we should not count on them to not finance coal plants. He further pointed out that renewable energy is already profitable, so it does not need incentives and tax breaks. It can compete with coal and gas in most markets around the world, even with all their $5 trillion of annual subsidies, according to the IMF. But remove some of those, Razzouk reasoned, and there would be an explosion of capital markets activity.

Thus, instead of just focusing on mobilizing private sector finance for the green segment, there has to be a focus on demobilizing private sector financing for the black sector. After all, they are the ones getting the subsidies in the form of not getting the carbon price and not paying for health or environmental impacts.

Question #6: *Barrow then selected a question from Pigeonhole on how MSMEs or start-ups can access finance, especially for green technologies and innovations. More broadly, how much bigger is the challenge for MSMEs?*

In response, **Barua** says that we need to change our mindset to relate more to the grassroots level and to experiment with some entrepreneurs at that level, for example, training for assembling of technologies. He believes promoting 100% renewable energy would lead to all sorts of small businesses, including spare parts of solar home systems, charge controller, LED assembly, and others. There are many opportunities for women, as they are strong in teaching, organizing, and computing.

To achieve these things, Barua suggests creating "microfinance plus". Innovation need not start at the ground level; it should also come from the finance sector. Different commercial banks should open that window for SMEs, for renewable energy, and for green entrepreneurs.

The focus needs to be on creating an enabling environment, as current practices are still too limiting, with a focus on protecting the banks. As of now, nothing is happening in the rural parts of Bangladesh, India, or Nepal. Thus, any solutions must relate closely to people in the countryside.

Question #7: *Moving on to technology and new technology platforms, Barrow mentioned a question from Pigeonhole, on how quickly the green space was moving, with all the technologies that can be deployed.*

Agrawal posited that the pendulum is moving, and will continue to move as long as it makes commercial sense, such that even SMEs will move to energy efficiency if they see business sense. Even five years ago, the cost was prohibitive, but not today.

Speaking as a financier, Agrawal said that it makes business sense for him to finance renewable projects because of the decline in dirty projects. As he said, if investors do not have dirty projects to finance, they will look at clean projects to finance – a move in the right direction. Technology helps in the sense that it's driving down the price, whether it's renewable energy or energy

efficiency products. If the green bond market is a $100 billion market, then tomorrow investors cannot ignore that fact and they will participate in that market.

Question #8: *Barrow went back to the "pajama guys." He asked how much they could be blamed for not being awake to the changing world or if their choices are more attributable to the lack of correct information that reaches them.*

Knowles highlighted the real value of good disclosure, which would allow financial investors to properly understand risk and to price for that risk. He pointed out that, although there is a lot of growth going on in the oil and gas industry, there's still $235 billion of junk debt sitting in that industry in the US. That information should have been available to the public, including the pajama folks so they would not sleepwalk into those kinds of transactions.

Most of the good disclosure work being done is voluntary. There is a carbon disclosure project, as well as the Principles for Responsible Investment group. However, Knowles suspects that a lot of money will continue not to be governed by good disclosure and good risk assessment until legislation is put into place, which makes it mandatory. He believes that the work of the financial stability board will give some important new guidelines in this area.

Day 2, 23 November 2016

Plenary Session 3: Green Technology and Business Innovation

Panel on "Technology and Innovation for Green Business: From Niche to Mainstream"

Moderator
Matthias Gelber, Co-founder, Maleki GmbH

Panelists
Alka Upadhyay, Assistant Vice President, Tata Sustainability Group
Chris Tilaka-Sri Dharmakirti, Executive Director, Strategic Enterprise Management Agency, Sri Lanka
Priyantha Wijayatunga, Principal Energy Specialist, Energy Sector Group, SDCC, ADB
Matthew Rajendra, Founder and CEO, Green Data Center LLP
David Sundahl, Senior Research Fellow, Emerging Research, Clayton Christensen Institute for Disruptive Innovation
Anthony Halog, Faculty Member, Industrial Environmental Management, University of Queensland

Matthias Gelber started the second day by stressing the importance of consumer demand and purchasing power, which impacts whether or not niche green businesses and technologies become mainstream. He provided two examples of green businesses that he started. The first was in certified environmental management systems in the UK, which moved very fast to the mainstream because so many companies asked for training, consulting, and certification services around ISO 14001. The second was replacing cement with secondary waste materials in Germany, which took off slowly because it was technology-based in an industry where change is slow.

The panel discussion, he explained, will feature case studies and experiences that will shed some light on how to move from niche to mainstream, and to see an economy where more businesses and green technologies are successful.

Question #1: *As the first question, Gelber invited Alka Upadhyay to describe the Tata Group's strategic approach to sustainability as a large corporation.*

Alka Upadhyay presented their company's experience in the green business. He first explained the complexity and diversity of the Tata Group. It's a $103 billion group that is spread across seven different sectors, in six continents, with 100 operating companies. It is federal in structure with 600,000 employees worldwide, and owns iconic brands like Jaguar, Land Rover, Tetley, and DCS, among others.

Against this backdrop, Tata wanted to achieve the "Tata Sustainability Stance", which gives direction to the Tata operative companies with the goal of becoming a global sustainability leader. To achieve this, they have worked to create an ecosystem, or build a culture, throughout the entire organization. They created a special governance structure, around which is the Common Minimum Agenda for Tata Companies.

Upadhyay further described Tata's Sustainability Governance Structure, which has two tiers. The first is the Tata Global Sustainability Council, which is composed of the CEOs of the various Tata companies. They provide the apex strategic direction. The second tier is the Sustainability Working Council, made up of Chief Sustainability Officers of Tata companies. They ensure implementation of the common minimum program, which includes actions related to climate change, life cycle assessment, water stewardship, and energy efficiency. There is also emphasis on resource productivity and circularity, disaster response, and also recently on natural and social capital valuation.

Tata also has a three-day Sustainability Leadership Program for their C-suite people – the CSOs, CMOs, CFOs, COOs, and CEOs of Tata companies. They do this with the help of Cambridge University. In parallel, they ensure middle management are informed about sustainability. The aim is to create a critical mass of champions, a backbone, to help drive their sustainability agenda.

Upadhyay also explained Tata's system for measuring and reviewing progress, which is part of the Tata Business Excellence Model. Tata's annual assessment includes sustainability aspects, in terms of processes and performance. There is also a stand-alone sustainability assessment framework, along with group-level key performance indicators.

Upadhyay then touched on three key elements: climate change, natural capital, and circularity. He first recalled Tata's climate change journey, which started in 2008. Their climate change policy pledged to be the benchmark on carbon emission intensity in their sector. Today, many Tata companies are national and global benchmarks on specific carbon intensity, which allows them to be responsible advocates.

The Group took a baseline of their carbon footprint and also did a 10-year forecast for a business-as-usual scenario. They then doubled their low-carbon strategy to make their footprint come down. This came in the form of "cost-abatement calls" for all Tata companies. The low-hanging fruit was energy efficiency, followed by renewable energy, which made commercial sense for Tata Power and Tata Motors. They also worked on technology upgrading, like smart factories and fleets through digitalization.

The company has also been working on: digitization to support smart factories and fleets; demand-side management; circular processes, such as recycling aluminum for the Land Rover, and natural capital valuation, including piloting five of their companies in the Natural Capital Coalition. Yet another area is green financing through Tata Cleantech Capital, which gives funds for putting up green technologies, and also Tata Motors Finance, which provides a different line of credit for CNG-based transport. The CEO of Tata Steel Group is also on the task force for climate-related financial disclosure.

Upadhyay concluded by emphasizing that, in order to mainstream the subject of sustainability in green business, you need to have clarity in your aspirations, a blueprint for achieving those aspirations, and sufficient investment. She cautioned that patience is necessary and communication protocols and measurements systems are a must.

Question #2: *Matthew Rajendra, the founder and CEO of Green Data Center LLP*

Matthew Rajendra shared lessons that are applicable to green technology industry ecosystem as a whole. The first lesson is the importance of applying "moonshot thinking" in innovating and commercializing green technology. If presented with a huge problem, come up with radical, out-of-the-box thinking, coupled with exponential (rather than linear) technologies. A second related

lesson is that it's sometimes easier to make something 1,000 percent better than 10% better, but the key is to throw out assumptions and get down to the fundamental truth, the physics behind something.

Rajendra then presented his product, Submersify. Their slogan is "take the plunge." They set out to solve the challenge of cooling data centers, which contribute 3.3% of CO2 emissions because of their use of huge amounts of energy. He pointed out that if the data center industry were a country, it would leave the fifth largest carbon footprint.

They discovered that air was creating problems for data centers, because air is a poor heat conductor. Taking a moonshot approach, his team found an innovation solution – submerging IT equipment into a coolant – thereby taking air out of the equation. As a result, energy consumption was reduced by 50%, along with a host of other technical benefits. In the process, they reduced the number of watts required, since fans were no longer required. This translated into savings for IT equipment. Only .04 watts are needed for cooling, rather than 1 watt. He figures that their coolant is 1,300 times more efficient than air.

Rajendra noted that everyone was skeptical when they came up with the idea in 2010, even after they came up with a prototype. In 2012, they came up with a proof of the concept, and skepticism started decreasing. From a pilot test to an expanded pilot test, skepticism came down further. Finally, in 2015, they closed two customers and obtained a hardware manufacturing warranty. Hewlett Packard tested their technology and they have now extended it, which showed that the product can be trusted. And right now, they've got a range of companies that are testing it. They went on to win five international awards, including the International Olympics of the ICT, the Industry Awards in Brasilia this year, and the United Nations award for their environmental efforts.

Rajendra further explained that they were able to achieve zero capital expenditures by embarking on a program called Energy Performance Contracting. They implemented their technology for free at data centers, and they got their money back on the savings. Instead of paying money to the utility companies, the data centers are paying the savings to his company.

In 2017, they then started a spin-off called Space Arc, which aims to provide 100% free energy for data centers by putting them in geosynchronous orbit. By putting them into space, you've got the full performance of solar energy.

Question #3: *Gelber asked Priyantha Wijayatunga about what could be learned from the renewable energy sector for other environmental business innovations, particularly in moving from niche to mainstream. He also asked about the role of ADB in promoting wider green business growth.*

Priyantha Wijayatunga stressed that the first and foremost thing is the demand. If there is demand, it is always the catalyst to get things moving. In renewable energy's early stages, development focused mainly in the off-grid areas. Demand drove small off-grid renewables systems, like hydropower, solar, and wind. These areas needed energy services, and there was no other way to supply them.

For instance, local entrepreneurs in Nepal or Sri Lanka are starting to manufacture small micro turbines. Electricians become trained in working on and repairing panels. Demand drives the whole sector, and businesses grow. For this to happen across a country or region, political commitment is necessary, and this will happen if there is demand from the people.

Wijayatunga explained that the ADB can support governments to create policies and regulations, and also help raise awareness at the community level, including about appropriate technologies. With governments, ADB can offer a carrot, in the form of lending money. This allows ADB to encourage governments to come up with the right kind of policies and regulations.

ADB also has an important role in helping bring down the risk of investments. This includes supporting pilot projects on various technologies and business models. An example is the Simpa Project, which is combining mobile technology and solar power to provide electricity services on a lease basis to rural communities in India. With ADB's investment, risks go down and the costs of financing also go down.

Question #4: *Gelber then turned to Chris Tilaka-Sri Dharmakirti about his work in venture capital investment and what types of green technologies he invested in. Gelber also asked about the main sectors that could see growth in the next few years.*

Chris Tilaka-Sri Dharmakirti explained that at Green Equator Venture Capital, they changed the model of the venture capital fund management. Before, there were many opportunities to invest in all kinds of spaces, but they needed to build an ecosystem of investing in companies and not in green entrepreneurs.

They found that millennials are the ones coming up with the ideas, while some of the older generations were stuck in the fossil fuel adaptation business models. Millennials, he explained, are placing their values into their businesses. They are not always looking for a massive multiplier of 10X, but focusing instead on the impacts they are making from their business.

When they initially raised funds for their venture capital fund, they had to stay away from the traditional pension funds and the usual types of investors who put money into venture capital funds. These investors look for exits in a five to seven-year timeframe. Instead, they wanted the fund to help create a new ethos amongst the millennial entrepreneurs.

Their fund focused on resource-based opportunities in Sri Lanka. For instance, they supported a couple technologies related to salt-water reactor designs that the US has developed. The first uses thorium, which Sri Lanka has, and the second uses graphene for the battery storage sector.

They have also delved into agro-technology. Here, they found two software companies that have developed a model to identify farmers who are planting and to match them with buyers via the internet to reduce post-harvest losses and excess surplus of products. The model allows people to pre-order the harvest from the farmers and also allows farmers to know who else is planting what, so there is no surplus of products. In transport, they have supported the conversion of tuk-tuks into electric.

On possible growth sectors, Dharmakirti mentioned the phase-out of hydrofluorocarbons (HFCs), which opens up a huge opportunity for people to retrofit their existing air conditioners. For future opportunities, Dharmakirti stressed that they are not always looking for exciting and sexy technologies, the billion dollar Facebook valuation. Instead, they are focused on on-the-ground results.

On the financing side, he believes bilateral funding and sovereign funds will likely provide the most money. He gave examples of the Norwegian Sovereign Fund and the Clean Energy Fund coming out of Korea, which is $100 billion from 2020. On the venture capital side, he noted that Silicon Valley has dulled down some of the monies coming into the green sectors. They see configuration that is $128 billion in VC monies that they invested globally, but out of that, only

about $4 billion came in for agri-tech, and less than $1 billion dollars for other green investments. So it is not really sexy right now.

Question #5: *Gelber next asked David Sundahl about some of the research he has done on successful business models for disruptive innovation.*

First, **David Sundahl** explained that there are two kinds of technologies or business models. The first are those that sustain existing institutions in a way that it knows how to make money. The second are disruptive, which provides things to people who previously did not have the chance or opportunity to consume them.

These technologies help people solve a practical problem that has social and emotional dimensions to it. Often, these social and emotional implications are the gauging factors whether a technology is successfully diffused, not necessarily the more practical applications.

To demonstrate disruptive technologies, he talked about the ADB-supported solar home system in Bangladesh. The villagers were happy about the 20-watt systems not because they provided electricity per se, but because they could work late, keep their businesses open until much later in the afternoons and evenings, and keep the lights on longer so that their kids could study.

He made the point that no one seeks to buy a particular technology. Rather, people look for ways to solve their problems. If you look carefully and build the right kind of business models, many technologies that might otherwise not be good enough for mainstream applications actually will be well received by many people.

Another example is ChotuKool, which are small rechargeable refrigeration units that have sold well in rural India. It solved the immediate problem of keeping produce fresh longer. However, they discovered that people hide their units at the back of their house, because owning a ChotuKool means you are poor, that you cannot own a real refrigerator. In response, ChotuKool redesigned their units to look cooler.

To close, Sundahl cautioned not to take up fortified hills, but instead to find customers and partners that nobody else is interested in. He also advised to understand people's needs, to look a layer deeper, which will help business scale up quickly.

Question #6: *Next, Gelber turned to Anthony Halog to ask what could be learned from the concept of circular economy in terms of getting from niche into mainstream.*

First, **Anthony Halog** defined circular economy as a means of maximizing the sustainable use of resources, whether it is water, energy or minerals, and also of reducing waste and emissions to air, water, and land. He stressed that the core essence of circular economy is really finding value out of waste.

He described their efforts in promoting "Advance Queensland", where they are analyzing the whole supply chain of the agri-food sector so that they can identify value-adding products, such as biochemicals, bio-plastics, bio-energy, and biofuels. He believes this model is applicable in the Asian region, as the region has a competitive edge because there is a lot of waste and biomass. He noted that most of the food waste in developing countries happens after post-harvest, rather than on the consumption side.

For him, developing Asian countries should innovate to create new biomass-based products because there is a lot of potential. Circular economy is a great philosophy, along with the green economy, to implement innovative and transformative ideas. In keeping with this philosophy, there is a need to think in terms of systems rather than in quick-fix technological solutions. He repeated the idea that social, emotional and ecological contexts should be considered as well.

Question #7: *Taking a question sent through Pigeonhole, Gelber asked the panel how green business practices, such as upcycling, could be made into an industry standard rather than a mere CSR stance for businesses.*

In response, **Upadhyay** stated that actions need to be connected with business drivers, not just with CSR directors. Though CSR is good seed money, it is not there for long. By upcycling or recycling, the use of virgin raw materials is minimized, thereby reducing financial leakages. The business case has to be there.

Halog stressed that upcycling must be pursued in the context of the circular economy. To really advance the interconnected UN SDGs or the climate change agenda, there is a need to take a systemic approach, rather than adopt quick-fix technologies, which is a silo approach. It won't work, because technology by itself will not solve the issue of sustainable development.

Question #8: *Gelber moved to the next question in Pigeonhole. "Most case studies seen are of 10% improvement type, which means they are just causing a little less harm, hardly any moonshot type. How then can moonshot thinking be mainstreamed among business leaders for going green?"*

For **Rajendra**, it is all about value proposition and financial sense. When he first started presenting to the ICT industry people, he focused on environmental impacts, and he was not getting follow up. Finally, after one year, he changed his pitch to emphasize cost savings, and that is when people started listening. In terms of moonshot thinking or bold ideas, Rajendra believes it may be an innate thing and is not sure how it can be developed.

Upadhyay, on the other hand, cautioned about dismissing 10% improvements. It has to be a mix of gradual and disruptive innovation. She also clarified that R&D guys should not be measured with the same yardstick used for operational heads. Instead, focus on creating a culture that will encourage moonshot technology. It's important to allow enough time for these to be developed. For instance, Tata has a Group Technology Office that is working in a number of long-term areas such as nanoparticles, graphene, and digital technology in smart factories and fleets.

Sundahl affirmed this point of not measuring new things with the same standards as already existing projects in a firm. Moonshot technologies are nascent and should not compete for money within a firm on the same basis as existing projects. Instead of thinking solely on the basis of profit and loss, firms should also adopt a development framework. Early stage products should be managed differently than those in the mid and late stages.

Question #9: *Going back to Dharmakirti, Gelber asked about the possibility of applying moonshot thinking at the government level, and how they can be enticed to take proactive steps.*

Dharmakirti noted that promoting change, whether in the public or private sectors, requires institutional thinking, where you empower staff to come up with innovative solutions. However, the public sector typically does not encourage innovative thinking and is more about playing it safe.

To give an example of moonshot thinking in the public sector, he gave an example from Sri Lanka. After finding out that fertilizers are harming the soil, the government took away the subsidy for chemical fertilizers and gave it directly to organic farmers to help them rebuild their soils. That was a substantial financial contribution. They also banned glyphosate. This government action encouraged 50,000 farmers to go organic, and the whole country is going in that direction.

He also gave the example of the apparel industry in Sri Lanka. The government allocated quotas to rural towns, so that entrepreneurs had to set up their apparel business in rural towns. This helped job creation in those areas, and also more green factories that are mindful of recycling and cradle-to-cradle thinking.

Question #10: *Turning to Wijayatunga, Gelber asked how people could access ADB's support for green business innovation.*

Wijayatunga pointed to ADB's Resident Missions as the first points of contact. There are focal points for different sub-sectors, including agriculture, energy, and transport. There are also people in ADB headquarters that are leading various interventions in green business. For instance, Wijayatunga works in the Energy Sector Advisory Group, which runs a few technical assistance programs. One program is helping emerging clean technologies go to commercial scale. ADB acts as the interface between the technology providers and the users.

Question #11: *Taking another Pigeonhole question, Gelber asked Halog about whether the price of green products is higher than normal products.*

Halog stated that is about demand. He described a tool – Systems Analysis Model – that estimates the price based on the projected demand. For a new product that will be introduced to the market, they do a large-scale sustainability analysis, which considers economic, environmental, and social indicators. Once they consider two to four best scenarios, they can talk to manufacturers about the right timing for mass production.

Dharmakirti offered another perspective. He does not support comparing the price of green products with generics, because the former provides benefits beyond what the generics provide. Part of the marketing of green products involves selling the benefits, and attaching an intangible value, beyond the utilitarian value, that people have not seen. This involves explaining that the externality costs have been reduced by these technologies. It also involves showing that consumers have been spending their money on externalities elsewhere, so there are actually savings.

Question #12: *In conclusion of the session, Gelber asked each panelist to provide one recommendation to businesses out there on how to go green, or to hardcore green business on how to go mainstream.*

Going first, **Upadhyay** offered advice to the Chief Strategy Officers and also CSR and HFC professionals. He stressed the importance of embedding whatever is being driven as a part of business strategy. There should not be a separate sustainability strategy. Otherwise, it will always sit on the fence.

Dharmakirti believes what is lacking is equity funding at the start-up stage, mezzanine finance, and series A-B-C-D finance. He urges ADB to provide an apex matching fund to help seed more venture capital funds in the region.

Wijayatunga's advice is to create demand. That can be done through pilots or tapping some of ADB's funds for that kind of purpose.

Rajendra stressed building in low cost from the beginning. Put in a lot of effort to make sure your operations have low overheads and low manufacturing costs. Second, he suggested having different messages or value propositions for the whole C-suite. The CEO, CFO, and Chief Technical Officer all want to hear different things.

Sundahl advised looking for high potential opportunities. Instead of focusing on how to make the technology good enough for the mainstream, find people who will be happy with the technology as it is now.

Finally, for **Halog**, business leaders and policymakers should learn systemic innovation, which is a requirement for mainstreaming any technology. This also involves looking at the interconnectedness of issues, particularly at the nexus of ICT, water, energy, agriculture, and finance.

Track 1A – Mitigation Banking

11:00-12:45 p.m.
Auditorium B

Chair
Herath Gunatilake, Director Environment and Safeguards Division, ADB

Speakers
Douglas Pabst, Division Chief, Drinking Water and Municipal Infrastructure Branch, US Environmental Protection Agency
Mark Laska, Founder and President, Great Ecology and Managing Director, Tellerium Partners

Panelists
Ritesh Kumar, Conservation Program Manager, Wetlands International – South Asia
Ary Sudijanto, Director for Environmental Impact Prevention of Business and Activity, Directorate General for Forestry and Environmental Planning, Ministry of Environment and Forestry – Indonesia
Eang Sophalleth, Under Secretary of State, Ministry of Environment, Cambodia
Simon Baptist, Chief Economist, Managing Director for Asia, Economist Intelligence Unit
Matthias Gelber, Co-founder, Maleki GmbH

Herath Gunatilake set the first breakout session in motion by defining "mitigation banking". He explained that the concept involves a compensatory reaction in response to destroying some part of the ecosystem for development purposes. In the location itself or somewhere else, you create the same ecological asset.

In his view, the most important thing about mitigation banking is that it allows both development and environmental protection to take place, while providing incentive to the private sector to provide that service on a profitable basis. Thus, there is no need to provide an additional push. Once the incentives are created in the economy for the private sector to provide something on a profitable basis, it will sustain itself on its own.

Gunatilake went on to explain the several advantages of mitigation banking, which he considers the "crown jewel" of green business. The first is that it reduces the uncertainty about whether compensatory mitigation will be successful in offsetting project impacts. In a normal situation, a project developer has to use their own company to undertake the restoration, and there is no assurance this can be done on a timely basis to offset the impact. In comparison, mitigation banking systems have certified wetlands that can be purchased by a project developer, so there is no such uncertainty about mitigation action.

The second major advantage is that wetland banking works for all sides involved – developers, regulators, and the conservation community. For developers, it allows for time savings. If a project developer tries to do all the work, they need to keep certain expertise within construction companies, such as ecologists and engineers. This is not economically efficient and can also lead to a lot of delays. With mitigation banks, all that is required is to get a permit from the government to do property development. The project developer can just approach them and buy the wetlands. It is very quick.

Regulators also find it easy and cost effective because they know the system even before they allocate any part of the restored ecosystem for a particular project. Everything is certified, even the cost of monitoring and compliance. For the conservation community, the certified restored ecological assets will be sustained by bankers forever to ensure that the destruction happening in some places is fully compensated.

Despite the success of the model, there are still questions whether these kinds of flexible innovative approaches can work in the Asia and Pacific region. In this regard, the governance regime and the capacity of the regulatory agencies are two key factors. Land ownership is another. Under poor governance circumstances, there could be a lot of wetlands on the books, but nothing on the ground.

Gunatilake explained that the objective of this session is to see whether some of these ideas can be borrowed, probably amend them a little bit to suit specific situations, and then apply them.

Question #1: *The next presenter was Douglas Pabst, the Division Chief of the Drinking Water and Municipal Infrastructure Branch of the United Stated Environmental Protection Agency.*

Douglas Pabst discussed his experience working on drinking water supply in New York City, which has one of the largest unfiltered water supplies in the world. The watershed is over 2,000 square miles in size and reaches over 125 miles in eight counties. It's cheaper to protect the water at the source than to treat it afterwards.

Pabst compared the cost of filtering versus protecting the watershed. He estimated that a filtration plant large enough to cover the whole system would cost $10 billion and another $110 million annually in operation maintenance. In addition, there are health and safety issues that arise with filtration. In comparison, protecting the watershed costs only about $100 million a year.

He noted that nationwide, excluding New York, only six water systems that serve over 100,000 people are able to avoid filtration, per requirements established in the Safe Drinking Water Act. Most of these are within state federal parks around them. They don't have the type of development and agricultural component that New York's watershed has. Another thing that sets New York's water program apart from others in the U.S., aside from their larger population and volume of water, is that their program is fully funded.

Pabst then highlighted the farm program within the watershed, the main theme of which is working with landscapes and protecting water quality. He noted that there are over 300 farms in the watershed. Pabst highlighted a number of elements of the program related to ecosystem services. These include land acquisition, conservation easements, farm rescue, and the watershed agricultural program. These have the most direct link to the mitigation banking concept.

He explained that land acquisition purchases are undertaken selectively, with properties prioritized based on the presence of key natural features, such as streams, wetlands, proximity of the land to reservoirs, and potential for development. Land is only purchased from willing sellers and it's at a fair market price. Prior to purchasing the land, New York City consults with local governments to ensure that community interests are taken into account. They can exempt certain areas from the land acquisition program.

Conservation easements are an innovative area. These provide assistance to landowners to preserve family land and get some funds at the same time, while protecting water quality. Without

conservation easements, the land can be easily sold to developers and pose potential threats to water quality. With the easements, the protection stays with the land and not with the owner.

Farm rescue is one of the newer parts of the program that is still more of a pilot approach. This program helps address farm foreclosures, which are another threat to land preservation. Pabst explained that a lot of young people want to get into farming, but they don't have the money and capital to buy the land and to start their own production. A temporary in-fee acquisition program is being developed to allow a private entity to purchase properties that are at a high-risk for foreclosure or distress. The investor gets an immediate return by getting conservation easement on the land, and then they can lease the land to young farmers and get a further return on their investment, thereby allowing the young farmers to get a start on the watershed and generating some income from it at the same time.

The fourth element that Pabst discussed was the agricultural program. This program addresses the potential sources of pathogens and nutrients. It offers a multi-barrier approach, including source-control, transport pollutant reduction, and prevention of contaminants getting into waterways. Agricultural engineers work to develop whole-farm plans, including agricultural best management practices and technologies, such as pairing in buffers, nutrient management, and water conservation. The program also promotes organic farming and sustainable farming, to keep locally grown food within the area, thereby decreasing carbon footprints.

Pabst then went on to discuss various funding and financing that EPA brings to the table, particularly for the water and wastewater industry. For instance, the Water Infrastructure Finance and Innovation Act helps fund innovation, in addition to the EPA Clean and Drinking Water State Revolving Fund. These provide seed money that could be accessed by municipalities and states for innovative measures.

Pabst closed his presentation with advice to the participants to focus on communication, education and outreach.

Question #2: *The next presenter was Mark Laska, Founder and President, Great Ecology and Managing Director, Tellerium Partners*

Mark Laska started his presentation by providing a brief description and history of mitigation banking and ecosystem services banking in the US. He explained that the US is extremely protective of its natural resources and there is a huge volume of regulations at the federal, state, and local levels.

Ecosystem banking is really just the notion that the mitigation offsets that are planned from infrastructure projects that end up harming the environment can be replaced by projects elsewhere. These projects can be done by third parties, which are private investors who purchase land and conduct a project and quantify the habitat uplift, in terms of how much they have improved ecosystem functions, how much wetland they've brought back. They then sell those credits to developers that need them under the regulatory programs. Instead of preserving ecosystem services, wetland banking actually helps improve them.

Laska then described the 25-year history of wetland mitigation banking in the U.S., explaining that it took many improvements to make the system work. In 1992, there were only six banks. It was on life support in the early years, and it took a really long time to take off.

However, there is now exponential growth. By 2015, there were 2,500. And today, there are nearly

3,000 banks. The market is also substantial with an estimated size of $1.5 billion in credit sales transacted every year. The market has spawned about 250,000 jobs. From the 1950s to mid-1970s, about 450,000 wetlands were destroyed annually in the US. The wetland banking system significantly reduced this destruction.

Laska next presented his list of ten vital ingredients to create a successful wetland banking program. The first is regulations. In the United States, the key piece of legislation is the Clear Water Act, which provides the basis for No Net Loss of Wetlands, which helped create the concept of wetland mitigation banking. No Net Loss of Wetlands means that if you adversely impact or destroy wetlands in one area, you have to put them back somewhere. There are all sorts of formulas and calculations used to figure out how many are put back. The regulations protect the habitat.

From wetland mitigation banking, there is now species banking, conservation banking, water quality trading, natural resource damage banking. Each of those trading schemes spawned from a regulation that causes the enforcement of habitat protection, and that is key. It's not just a factor; it's a vital ingredient for the success of the system.

The second ingredient is regional development, which requires that land is converted from pristine habitat to development. This can include all sorts of development, including waterfront development, infrastructure, roadways, transportation, real estate, energy, mining, terminals. Without that development, nobody needs mitigation credit in the US.

Third is habitat classification, which allows regulators to know what is out there. In the US, there are many ecologists who are studying and defining habitat, and that is critical in understanding the potential impact of projects. The next factor is finding suitable habitat, which is both good and bad. It is good from the standpoint that there is a lot of land that can be enhanced, preserved, protected, and restored. The bad news is that there is a lot of land in the US that needs to be protected, since there has been a lot of wetlands degradation.

The fifth critical ingredient is market demand. Without the project, there is no purchaser of a credit. This is key for the private sector because they need somebody who has a project and funds, who is willing to pay them for their credit. Without that, there is no banking system. Sixth is a ready supply of credits. Fortunately, there are a lot of credits in the US, as there are around 20,000 wetland permits processed every year by the Army Corps.

Another important element is the ability to make cost-effective credit, meaning producing it for less money than it can be sold. If investors can spend $100,000 an acre on a credit and then sell it for $200,000 an acre, they are happy. If they can sell it for $500,000 an acre, that makes them even happier.

The eighth factor is stakeholders. Without them, the system collapses, as somebody has to keep the pressure on developers, bankers, investors, and regulators. The most successful banks are from the projects where they have NGOs or stakeholder groups that are supporting those. Ninth is investor capital. Investors have to be willing to take the risk, given that in most cases, there is no guaranteed money in mitigation banking.

The tenth element is the need for training and monitoring. In the US, there are about 250,000 people that are employed in the banking industry right now. That is a huge business.

Laska added another factor to this list at the end of his presentation – a government driver. United States' President Barack Obama, in a presidential memo that came out in November 2015, encouraged private-sector development of environment credits. The government shows that it has opened up to manifest that the system is fine, and it has worked.

To close, Laska explained how they develop a bank. An investor looks at three things when they want to evaluate whether they want to invest. First is whether they can build a project at the site. Second is whether they can get a return on investment. And third, whether they can get it permitted. When those questions are answered successfully, one will have projects that work.

He then provided examples of projects to highlight that there are many projects that can be very bankable and very investable. The challenge in the Asia Pacific region is to find out what will work in the region and what will be investable projects.

Question #3: *Gunatilake next asked Ritesh Kumar to comment on the first two presentations, especially on how the flexible instruments can be introduced in the Asia and Pacific region and what are the barriers and potentials.*

Ritesh Kumar shared that in 2010, Wetlands International and some organizations were tasked to compile economic values of wetlands. The publication is in the form of the TEEB Water and Wetlands Synthesis report. One of the key conclusions of the analysis was that wetlands were indeed very valuable, but the opportunity cost of restoring a hectare of wetland was also very high. Thus, it made no sense to allow wetlands to degrade. Yet, when you compare the value estimates with the trend of wetland loss, the trends are slowing down in North America and Europe, but in Asia, wetlands are rapidly degrading.

In the last 50 years, the public policy for wetlands has borrowed largely from terrestrial systems. There has been a push to include more wetlands under protected areas and for more public subsidy-led approaches. Yet, the trends are still falling, so there is a need for newer approaches. Restoration projects still do not have the right balance between conservation and development. The Ramsar Convention has the highest number of listed sites in Asia and not more than five or six restoration projects to date.

At the same time, the funding for wetland restoration is still not there. For every $100 that we need for wetland restoration today, less than one or two dollars are available from the government. So there is no money, and wetlands are being lost. Ecosystems services are not accounted for.

Kumar stressed that the private sector needs to be a part of the solution, and wetland mitigation banking is a practical way to do it. Yet, he believes Asia is less prepared to leapfrog to such a solution. One reason is that the No Net Loss approach is largely missing in the region. Secondly, the location of wetlands in most Asian countries is not known. The information base must improve, so that a developer can better understand how they might impact wetlands and also talk to the government about what is possible.

Third, government is not yet providing confidence to the private sector in terms of providing regulatory consistency. At best, wetland policies in Asia are a work in progress. Those political milestones are missing in most countries. It could be another decade before these projects materialize in the region.
Finally, Kumar pointed out that it's also about restoration capabilities. Within the region, there is still a lot to learn about managing restoration, which is a mix of technical and social engineering. There is a big role for agencies like ADB and Wetlands International to get models more

recognized, so that concepts of wetland mitigation banking can flourish.

Question #4: *Gunatilake invited Ary Sudijanto to talk about Indonesia's perspective on wetland mitigation and forest conservation, including various peatland conservation. He also asked Ary how Indonesia could develop some flexible approaches where the private sector can be involved on a profitable basis.*

Ary Sudijanto started off by talking about flexible approaches. He pointed out that the Indonesian law allows for multiple and integrated approaches in environmental management. For instance, Indonesia has a sustainable financing institution and other approaches, including disclosing information about the environmental performance of companies.

He also pointed out that Indonesia has a form of mitigation banking, but it is a different scheme than what the US implements. There are three parts from the government side. For forestry, people can use forest areas for development purposes. Almost two-thirds of Indonesia is forested, and this is divided into protected forest and production forest—43% is protected forest and almost 57% are production forest.

According to the regulations, every province needs to provide at least 30% of their land as forest area, but some parts in Indonesia are below that, such as some provinces in Java. For provinces under 30% forest area, there is a compensation scheme to allow people to use the production forest and part of the protected forest for non-forestry utilization. The land compensation ratio is 1:2, so if they want use 100 hectares of forest area, they need to provide 200 hectares as compensation. For non-commercial purposes, like for infrastructure, government and others, they need to rehabilitate the forest. The ratio is at least 1:1.

For provinces that still have more than 30% of forest area, for commercial purposes they need to make restorations in the watershed and pay a non-tax government fund. For the government's purpose, they only need to plan to make the restoration in the watershed.

There are also different schemes that are more like payment for environmental services. Sudijanto provided an example of a company in Java that provides industrial water for steel and petrochemical industries. To ensure water is sustainable for business use, they pay people to maintain forests in the upstream. The payment is $350 per hectare, and the people maintain 400 hectares. For five years, they can get $175,000 added to their incomes, because they can still get other benefits in their land. Another scheme in Java involves two municipalities. One municipality pays a neighboring municipality to maintain their forest. Sudijanto believes this kind of scheme should be expanded in the future.

Question #5: *Gunatilake next asked Eang Sophalleth to bring in some Cambodian perspective to the use of flexible approaches.*

Eang Sophalleth explained that the Ministry of Environment has overhauled the environmental management scheme in the past few years. All of the protected areas are now under the Ministry of Environment, and they are in charge of forest protection. On the subnational level, law enforcement is not adequate, so they have to be more pragmatic and flexible. Sophalleth stressed that they are not looking at the moonshot. They are instead looking at modular problems so they can work step by step.
For instance, in the rural areas where 70% of the population lives, people are resorting to firewood for cooking. To resolve this issue, they are supporting the use of coconut shells combined with waste for firewood. Another method is introducing biodigesters. With a few pigs and cows, their

waste can turn into fuel to generate electricity, cooking gas, or organic fertilizer. So far, there are 23,000 biodigesters operating. Workers borrow money from microfinance, build it, and pay it off two years later. Countrywide, there are 63 microenterprises to build these biodigesters, which reduce carbon emissions amounting to about 335,000 tons in five years.

Another success story is in water. In the Mekong River, there is an abundance of water but not clean water. People are using firewood to boil water so that they can drink it. In response, a ceramic drinking water purifier was introduced, so that people do not need to use firewood anymore. This initiative, which is supported by an NGO, reduced carbon gas emissions amounting to about 95,000 tons per year.

On the national level, large-scale illegal logging was curtailed by getting everything under one ministry. Also, the Ministry of Environment transferred more responsibility for illegal logging to the subnational level. Forest management has become more transparent and efficient, with more accountability. Because of that, they were able to sell carbon credits to Disneyland, and they are in negotiations with two other companies to buy carbon credits.

They are also expanding their forest coverage area, starting with mapping a Biodiversity Conservation Corridor, which involved connecting their forest protected areas together. This could help promote ecotourism, protect the environment, and harmonize the environment and the living conditions of the people.

Question #6: *Matthias Gelber was invited to share his thoughts about investing in reforestation projects in Panama.*

Matthias Gelber first shared that he was motivated by personal reasons. He wanted to invest and also help the planet at the same time. He found his answer in sustainable forest investment, particularly a project in Panama run by a German company. The land has a biodiverse forest, not a monoculture. It is a rolling system that generates income. The strategy is not to clear-cut, but to selectively harvest and to always have a forest area with biodiversity.

Gelber explained that the project had three things that made it very attractive. First, as a foreigner, you can own the land in Panama. Second, the country has tax exemptions on returns for reforestation to encourage money from private investors. And third, the project had a long-term investment plan, carbon footprint analysis, and high-quality third-party verification.

He bought the land 12 years ago, after first visiting the site. He bought it for $17,000 a hectare, and recently sold one hectare to a friend for $45,000. A US pension fund bought the other eight hectares. Because of the personal ownership, he explained, the return was very good. He exited with 100% return. Gelber got his carbon credits after 10 years, 200 tons. He could have sold them, but he decided to keep them for himself to feel good, as he is excited that the project absorbs CO2 emissions every day.

Gelber stressed that, in addition to having the right framework conditions, timing is critical. Now, if you want to enter the same system for one hectare, it costs $35,000. Land prices have gone up and legal costs are higher.

Question #7: *Simon Baptist, Chief Economist and Managing Director for Asia of the Economist Intelligence Unit*

Simon Baptist highlighted the diversity of the region, particularly in terms of readiness to undertake flexible approaches like mitigation banking. Asian countries need to look at their own national circumstances to determine feasible solutions. In countries like Singapore, such approaches can be done because it has the required data requirements and institutions, while countries like Indonesia and Cambodia operate on a more basic level.

The question is how to determine the best approach to minimize environmental destruction and also to optimize what is left, accepting the fact that there is going to be some degradation. Baptist voiced the opinion that basic regulations, like those found in North America in the 1950ss or 60s, might be the best place for many Asian countries. That is where you can have the highest gains for the least amount of cost.

Baptist stressed the need for a baseline of ecosystem quality, so changes can be compared against this baseline. However, many developing Asian countries will have a problem with this approach, which we have seen through climate change negotiations over the years.

Baptist asked whether the baseline should be what would happen if there's no regulation by 2030, or should it be where countries are now. It could even be determined by whether countries adopt baseline practices, say from places like North America. That is a complicated debate, both ethically and practically. Regarding the latter, measurement and data availability are really acute issues in the region. There is also a lack of capacity to assess ecosystems services, including big issues around land ownership

Question #8: *Turning to questions from Pigeonhole, Gunatilake asked if there are any similarities between mitigation banking and cleaning up pollution by the polluters themselves.*

In response, **Laska** pointed out that mitigation banking works for two reasons. The first is that projects are going to happen. Mitigation banking is not what allows projects to happen. An example is expanding highways to allow for more traffic, which may affect wetlands. The US has a complicated permitting system that is going to protect a variety of things – the air, the traffic, the noise, the social impacts, the cumulative impacts. Mitigation banking is just one simple element to offset one of the effects.

The second point is that the private sector has promoted mitigation banking. The government simply gave the platform. So, mitigation bankers do not require the government to invest a lot of time and energy and money around compliance. That is what his company does. Mitigation bankers take that responsibility off of the plate of polluting companies and the regulatory community. They take the risk and liability of completing the project and ensuring that it reaches certain standards.

Baptist reframed the question. He believes the question is really asking, "Is it okay to destroy something if I fix something else somewhere in another location? Or shouldn't it actually just be wrong to destroy something in the first place?" Baptist pointed out that this is an old debate, but he pointed out that the reality is that development will destroy ecosystems. He believes that it is better to replace something somewhere, rather than try and pretend that we can stop any degradation from happening.

Question #9: *Another Pigeonhole question inquired whether it is better to declare a wetland a protected area rather than going through a banking system.*

Volunteering a response, **Gelber** pointed out we have to distinguish between different wetlands in Asia. There are peatlands, which are an extremely rich carbon stock that has been building up over tens of thousands of years. Once they are drained, those areas are prone to fires during the dry period. The resulting haze has led to economic and environmental problems.

Gelber believes that peatlands should be preserved without any questions. However, there needs to be money and resources to support Indonesia and Malaysia in preserving peatlands. For that, we need to have the right mechanism to support that rich carbon stock to preserve it and have financial compensation for that.

Gunatilake offered his own response. He shared his belief that, in any country, there should be some pristine wetlands that should not be part of the banking system. If the wetland purely provides biodiversity-oriented services, wetland banking cannot recreate them. However, the flood-protection and water purification functions of wetlands can be recreated, Thus, in developing wetland banking systems, the conservation management plan for a country needs to be considered, along with the functions of different wetlands. That, he said, is one part of the answer.

The second part relates to our experience with protected areas. Unfortunately, protected areas face the problem of no budget and resources. Poor people live around them who need the resources, and there is no way to control them. Thus, protected areas cannot be managed properly. Unless there are a lot of public resources to manage protected areas properly, it does not work.

That is why protected areas may not be a perfect solution, on one hand. On the other hand, if you declare some land as protected land, it cannot be used for any development purpose. Gunatilake believes that such separation of environment from development is detrimental, because it is bound to fail. If you combine development and conservation, it works. Otherwise, it does not.

Sophalleth then touched again on the Cambodian experience. He agrees that we have to protect certain areas. In Cambodia, they mapped out what areas were to be protected with their master plan in mind, and also with the corridors that would be set up. The key is to find an alternative source of income to maintain those areas. However, it does not have to come from the public. Rather, you have to bring in investment, for instance through ecotourism. Otherwise, protected areas will not work.

Question #10: *Gunatilake selected another Pigeonhole question, which asked if the mandate for offsetting can only come from the government. Or put another way, if the private sector can also have their own self-regulated mitigation systems.*

In response, **Laska** explained that in the US, the government created the mandate for the offsetting and then stepped back to let the private sector turn it into a business. The private sector was able to do so through a series of refinements. Now, it is at the point where there is widespread development of credits.

One of the main reasons for its success is that investors have to put up capital. They have to put up cash at risk in the form of a bond. If the habitat project does not perform according to certain criteria, then the investor is at risk of losing that. With the payment of ecosystem services model, there is no performance risk. There is nothing like losing a lot of money that can focus the minds of investors.

Sudijanto highlighted that in Indonesia, forest protection is actually led by people. Farmers make

a farm and they keep 100 hectares of land to have a forest there. They get a payment from the company that needs the water, which is regulated by the forest.

He also mentioned the importance of addressing urban flash flooding. Some effort to restore the wetlands around the cities can reduce the intensity of flooding, and city dwellers could pay a little extra tax if they are protected from floods.

Question #11: *To end the session, Gunatilake invite every panelist to offer a quick take-home message.*

For **Pabst**, one important message is to be optimistic. Keep working to communicate with people about the importance of the environment. Instead of top-down, there is a need to start looking bottom-up—what's going work to meet the needs of the people.

Gelber highlighted that our personal investment behavior and purchasing behavior can make a difference if we put our money into preservation rather than exploitation. So be the change.

Baptist stressed that there is still a lot of work to be done in getting the basics right in this area, and that getting the regulatory design correct is also very important.

Sophalleth announced that Cambodia adopted the Paris Agreement, and the country is part of ASEAN. As part of the same destiny, Cambodia wants to make its destiny better, especially in terms of the environment.

Sudijanto emphasized that a mix of approaches is needed, including command-and-control and market-based. Integration of approaches is needed.

Kumar stated that shying away from innovative approaches like mitigation banking is not an option for the region anymore. It is time to get the private sector into conservation.

Laska echoed Kumar's statement. He asserted that there is broad interest in applying wetland banking in some form in Asian countries. And the time is now.

Gunatilake offered the last comment. He noted the region's huge diversity in country abilities to create and manage new regulations. Given this diversity, there cannot be a one-size-fits-all approach. There needs to be very site-specific, country-specific, and problem-specific approaches. He believes that there is great potential in this region for businesses to do well while doing really good for the environment.

Track 2A – Business Opportunities in Natural Capital

11:00-12:45 p.m.
Auditorium C

Chair
Bruce Dunn, Principal Environment Specialist, Environment and Safeguards Division, ADB

Panelists
Paul Tregidgo, Managing Director and Vice Chairman, Debt Capital Markets, Credit Suisse
Daniel Spitzer, Chairman & CEO, Mountain Hazelnuts Group
Chaoni Huang, Head of Business Development – Asia, Trucost
Yasushi Hibi, Vice President, Asia Policy, Conservation International
Agus Purnomo, Managing Director for Sustainability and Strategic Stakeholder Engagement, Golden Agri-Resources Ltd.

Bruce Dunn opened the session by discussing a general framework for natural capital, which he defined as a stock of natural ecosystems. This basic definition comes from the World Bank for their Wealth Accounting and Valuation of Ecosystem Services (WAVES) program.

The definition incorporates renewable natural resources, such as forests, water, farmland and biodiversity, as well as non-renewables such as minerals. Natural capital is referred to as a stock because it provides essential goods and services that are important for society and adds value to communities and economies over time. Natural capital provides services like clean water and protection from typhoons. There also services derived from natural resources. For instance, forests provide timber and oceans provide fisheries.

This is not much different from how other forms of capital provide value. For instance, built capital, like metro rail systems, airports, and roads, provide services, and social capital, in the form of education and training, contributes to society and provides wealth to the economy.

Throughout the world, natural capital is facing extreme threats. These stocks are being lost at a rate that has never been seen in the world before. In the Asia and Pacific region, this loss is happening at about twice the global rate. In the region, we have seen a decline of about 60% of populations of indicator species since 1970. This is especially pronounced in key economies, where there is rapid economic growth. Along with the decline in natural capital, there is a decline in wealth. There are some substitutions, but there is also a loss of opportunity.

Dunn stressed that one of the key challenges in the region is that apart from the loss, there is not a lot of investment. While countries are interested in public sector finance, public investment at the country level is still relatively small, which leaves a huge gap. There is also a lack of interest or willingness from countries in the region to invest in natural capital. They do not see it as an area that will bring economic returns.

Dunn then stated some of the key objectives of the session. First, the panel will discuss current business trends in natural capital, including private sector opportunities and financial flows. This includes emerging challenges, enabling conditions, and innovations. The second objective is to examine how natural capital contributes to the value addition for business – what's in it from the

business side. Third, the session will cover some of the policies and regulatory priorities, including creating the right enabling conditions and addressing barriers.

Presenter #1: *Paul Tregidgo*

Tregidgo stressed that the biggest challenge is finding a way to value natural capital. While there may not be one right way to do this, the wrong way is not to do anything about it.

The challenge is bringing conservation finance from niche to mainstream. There are pioneers who are seeking to combine real assets—tropical forests for instance—with cash flows such as from sustainable timber, agriculture, and tourism. However, it is not nearly enough to develop scalable, repeatable and investable solutions.

According to one estimate, preserving healthy ecosystems (land, oceans and natural stock of clean air, fresh water, and biodiversity) requires about $300 to 400 billion per annum of investment, but only about $52 billion per year is flowing into projects in the broadly defined natural capital space, mostly from the philanthropic sector.

Of the approximate $10 billion worth of annual private sector contributions, $7 billion comes from green commodities. That is, in some way, shape, or form, the monetization of certification. Perhaps more troubling is that 80% of those funds are raised from developed countries, and 60% are spent in developed countries.

Multiplying private sector investment by 20 or 30 times requires looking at what private markets want. While there are many segments to private markets, there are some common denominators about what is required, such as transparency, risk-adjusted market returns, and measurable conservation impact.

There are a number of reasons why the natural capital space is still struggling. Challenges include high search costs, lack of track records, lack of collateral, lack of scalability, imperfect monitoring, predictability of underlying cash flows, and lack of aggregation capacity.

If these challenges are to be addressed, there must be interventions by governments, the public sector, and regulators. Tregidgo believes that, similar to how central banks try to create a monetary environment to stimulate investment in small and medium-sized enterprises, bank activity around natural capital can be stimulated. He stressed several needs: comprehensive and accurate data, clear and stable regulatory frameworks, innovative financial products, technical capacity, availability for long-term credit, and deal pipelines.

Tregidgo highlighted that natural capital offers the ability to provide risk mitigation tools, which can help build on what demonstrably works in the areas of forestry, agricultural, and ecotourism. Models could be adopted around mature conservation markets and large ecosystem aggregated projects. For instance, he suggested that in aggregating projects from degraded farmland, farms (perhaps shrimp farms converted to sustainable farms, efforts around fishing grounds, and efforts around watershed protection), could have different projected cash flows and returns. If those projects could be aggregated, a stream of cash flows could be created and in their diversification and maturity become monetizable. These products could be incubated and brought to scale.

Regarding applicable tools, he cited the example of risk management and predictive tools and technology, which have enabled the insurance industry to insure against African drought risk. He also suggested convening around demonstrably large projects, such as the Great Barrier Reef,

which is going to throw off a range of private sector alternatives to solve ecosystem issues around these landmark projects. This will allow crowding in private sector investors to bring them to the next stage of the game.

He also highlighted a number of successful smaller initiatives, such as those by the Nature Conservancy, Environmental Defense Fund, Rainforest Alliance, and Asia-Pacific Rainforest Summit. These and other organizations are looking to pilot and aggregate projects. While they are still small, they will be impactful.

He also cited an example of something he worked on in 2014-2015. Working with Althelia, USAID, and the Climate Fund, they were able to put together a package of investors who wanted exposure to cash flows from the sale of certified products that came from responsible forestation procedures in Peru. While not a big sum (15 million Euros), the project showed that it is possible to identify cash flows and find investors around sustainable natural capital.

Tregidgo emphasized the need to prove it in scale since the capital and the intent is there. It needs more than just a nudge. As a realist, Tregidgo knows that there is a long way to go. As an optimist, he think it's possible to get there.

Presenter #2: *Daniel Spitzer*

Spitzer focused on the responsibility of ADB and other multilaterals. He first pointed out that private capital, institutional investment capital, has no choice about where it goes, usually because of the structure of the industry.

In contrast, multilaterals like ADB have a choice and an obligation. He noted that they can address some of the financial challenges with bridging tools like credit enhancement. They can also provide funding for projects on the public-sector side with governments, which are often constrained by populist election processes. In these cases, thoughtful decision makers may not be able to access the resources necessary to consider important issues. ADB can provide that funding, and it can do so and create safe forums for leaders to meet together.

Spitzer also welcomes more ADB activity in the private sector, and he added that ADB became their shareholder last year. Aside from being an investor, ADB also provided technical assistance funds to some of their stakeholders, such as on climate resilience and financial inclusion.

Turning to the topics of natural capital and green business, Spitzer discussed the need to build business models that respect natural systems, human systems, and cultural systems. In Bhutan, his company – the Mountain Hazelnuts Group – has close to 10,000 orchards and many tens of thousands of people engaged. They are the biggest private sector employer in the country. They are the first 100% foreign direct investment, and so they had to work closely with communities and leaders to figure out the appropriate way to make the business work for everyone (e.g. financial investors, those that run the business, farmer partners).

He described the challenge of addressing the social situation. In Bhutan, there is no industrial sector or service sector to absorb people, especially young people, so there are few opportunities for people from the countryside. Thus, the challenge is to find an appropriate model that creates ways to use their aspirations and provide them good engagement.

ADB played a significant role in the development of communities and empowering the people to have opportunities. However, both ADB and IFC, which are their partners, also have rigorous

credit risk analysis teams who look hard at a deal like this. When they decide to make an equity investment, they are expecting a good financial return.

Spitzer explained that the only way to start a business like this is to find a source of capital that is willing to make a long-term bet. Generally, institutions are unwilling to do so. Their model focuses on partnership and inclusion to allow farmers throughout the country to participate. The key is to build long-term economics that will support families, monasteries, nunneries, and community organizations. Those are their partners. They provide the trees, along with the services, at no charge. They sign 30-year contracts. People sell the nuts to them, and they guarantee a floor price and participation in the market as it goes up.

As a result, they are a little over halfway to their goal of 10 million trees planted. They have been planting actively for five years, including 2.5 million trees this year. Spitzer explained that they do not displace any existing agriculture, planting only on fallow or degraded lands. Execution is critical. They are planting 10 million trees, and this is all for export. It is all premium quality hazelnut, so this is a valuable luxury product that nobody needs and nobody is going to buy unless it is good. They need to distinguish themselves because nobody thinks about Bhutan as a place to buy a premium food product. Seedlings are grown starting from tissue culture. They are all non-GMO, selectively bred varieties that are ideal for the environment.

On the management side, he explained that in Bhutan, relationships are traditional. People know each other and do not distinguish amongst each other based on performance. This has implications for the bonus system. It means that there has to be unifying bonuses to everybody based on the overall performance. This is not easy, given that they have covenants for performance and they have to meet their numbers. He also pointed out that commercial agriculture is a new concept in Bhutan. Most farmers they are working with have never grown and sold anything in their lives. Thus, teaching them about meeting market standard and producing in a consistent way is a new approach for them, and that is a real challenge.

On the topic of monetizing in markets, Spitzer commented about the difficulties in taking advantage of carbon markets. Eventually, he explained, they will have 15,000 orchards. To audit that many orchards and to have a credit, which you can sell on the market, will make money for the consultants and no money at all for the farmers.

He also stressed the importance of investing heavily in training. Last year, they provided 12,000 hours of training. He also noted that 45% of their employees are women. He gave the example of people, many of whom are women, who have been trained in soil sciences and extension. Around 170 of these experts visit the orchards around the country, providing assistance on planting methods.

Another feature of the company is the use of phone apps. Over 100 reports are produced and sent off on phones, which is enabled by ubiquitous cell coverage in the Himalayas. As a result, they can easily transmit information and then aggregate. They can look at patterns, and also conduct specific traceability for different orchards. That is impactful in managing a performance operation.

Spitzer ended his presentation by stressing that everyone needs to look for opportunities, using both their heads and hearts. On the rational side, mitigating risks and using best practices are important.

Presenter #3: *Yasushi Hibi*

Hibi started by providing an introduction about Conservation International's work in more than 30 countries. They started as a biodiversity conservation organization back in 1987. As they grew, they came to recognize that they could not protect and conserve biodiversity simply by focusing on biodiversity. They instead need to work with communities, the private sector, and governments.

A couple years ago, Conservation International changed their mission statement and tagline. The latter is "Nature does not need people, people need nature." Their approach follows this tagline. They are trying to protect nature for the sake of people, and especially those who are living where there are vital ecosystems.

Hibi went on to explain why businesses should care about protecting natural capital. First, companies in sectors that rely on natural capital need a sustainable supply if their businesses are going to be successful long-term. These include the food and beverage industry and forestry. Even the mining sector has a disincentive not to destroy natural capital, as societal pressures affect them. Brand image is increasingly important, including in finding good employees to work with you.

He then pointed out a couple of important trends, First, markets are increasingly going to be in developing countries, where natural capital underpins sustainable development. Second, investors are increasingly looking at environmental, social, and governance issues. There are also more and more interlinkages between environment, social, and other global issues like the 17 goals that are set-up in the Sustainable Development Goals. These and other trends mean that companies need to increasingly acquire "a social kind of license" to operate in a certain region or in a certain market, or even globally.

Hibi next provided an example of Conservation International's work with the private sector and also with governments. They worked with Mr. Rob Walton, founder of Wal-Mart, to convene 10 head of states from Sub-Saharan Africa to declare the importance of natural capital accounting. Held just a month before the Rio+20 conference in 2012, the meeting provided a push to discussions about the topic.

On the topic of incentivizing change, he provided the example of converting mangroves into shrimp farms. The owner of a mangrove forest could gain about $1,000 worth of revenue per hectare of mangroves, but could get ten times the economic revenue if he converted it to a shrimp farm. However, this is because the many benefits from the mangroves are not accounted for, such as protection from tsunamis, habitats for fish, and carbon sequestration. With all those benefits, the mangroves might have an economic value of $20,000 per hectare. The problem, he explained, is that these benefits are not internalized in the economic system, so people would opt for shrimp farms. Thus, to make sure that the mangroves stay intact and the benefits continue to flow, there is a need to recognize and measure the benefits, and then some sort of compensation needs to be provided.

Hibi then presented the Starbucks case, which Conservation International has been working with in the past 15 or 16 years, mostly on the upstream side. They chose to focus on coffee because coffee-producing regions full of biodiversity hotspots. Among many other benefits, sustainable coffee production helps ensure clean water downstream.

They started by developing a sustainable sourcing guideline for the company, including both the environment and social side. Called C.A.F.E. (Coffee and Farmer Equity) Practice, the system is implemented internally but provides for third party certification. 99% of Starbucks' coffee beans

are now C.A.F.E. Practice certified, which requires the company to pay a premium price to farmers.

Conservation International also worked with Starbucks to support the coffee farmers on the ground so that they could meet the C.A.F.E. Practice guidelines. Field project are in Colombia, Mexico, Peru, Costa Rica, Panama, and Indonesia. There is also a microcredit scheme to help farmers shift from conventional farming to more sustainable models. They also use schemes called conservation agreements, which provides grants and sometimes services to the community based on foregone benefits. Meanwhile, on the downstream side, they worked with consumers to better understand the value of sustainable coffee.

Concurrently, Conservation International supports a payment for ecosystem services (PES) scheme to make sure that ecosystem benefits flow back to the farmers. This includes some carbon financing, which is provided by Disney and others. Hibi noted that they are also working with Disney on their carbon management plan, and this links to their coffee work.

Hibi ended his presentation by mentioning the Natural Capital Protocol. Many corporations and even the financial industry already became involved. He hopes that these kinds of initiatives will help others in the private sector to better understand and implement natural capital-based management in their businesses.

Presenter #4: *Chaoni Huang*

Huang first introduced his company Trucost, which is a group of environmental economists who demonstrate the market demand for environmental risk assessments in the mainstream world of finance. They provide science-based, data-driven insight to direct the flow of capital towards sustainable business models and investments. In doing so, they work closely with companies, investors, and governments to understand business and financial implications of environmental impacts.

According to a UN study that they published back in 2014, the economic consequences of environmental damage by business globally in the primary sector totals $7.3 trillion. That is 13% of the global GDP in 2009, or equivalent to the size of PRC's GDP at that time.

Huang explained that businesses around the world are highly exposed to environmental risks. To illustrate this point, he focused on the agricultural sector, which faces a challenging landscape of rising input costs, climate change, and environment degradation, as well as important issues such as nutrition, health concerns, and social inequality.

There is a disconnect between the detailed price of food production and the production cost. In a recent study for FAO, they found that the true cost of crop and livestock production is over 170% of the production value itself. Clearly, current accounting systems do not reflect environmental externalities. Huang believes that this free ride is not going to last forever, and we are already feeling it in a number of ways, such as rising commodity prices, extreme weather events, and water scarcity.

Thus, business needs to rethink the way they measure risks and opportunities. Precisely for that reason, Trucost works with companies to put a dollar value on the hidden environmental costs that they are facing. For example, they work with a company called Natura, a personal care company in Brazil, to help them look into different farming practices for palm oil. They have compared monoculture systems with agroforestry plus conservation. In the process, they found

out that the total economic value plus the environmental value generated from the agroforestry and conservation model is 20% higher than the monoculture system.

Similarly, they also work with Monsanto. The company has a mission to triple the yield of their core crops by 2030, while using one third less resources. To help them achieve that, Trucost looked at soybean production in Brazil. They compared monoculture systems against 80% soybean production plus 20% conservation of indigenous native forests, and found that the total economic value is higher with the conservation model. Local farmers also benefit from the improved environmental services produced by the ecosystem, and they also receive higher income.

Presenter #5: *Agus Purnomo*

Purnomo focused his presentation on the palm oil industry. He first pointed out that palm is the most productive vegetable oil crop and thus generates a lot of welfare to its planters. It is eight times more productive than grape seed, and ten times more productive than soybeans. That means to produce one ton of vegetable oil, you need 10 times as much area for soybeans compared to palm. Therefore, to convert palm plantations, which are now about 17 to 20 million hectares, to soybean plantations, it would require 200 million hectares of land.

Purnomo stated that despite a lot of negativity surrounding palm oil, it can be sustainable. And, in fact, his company has proved it. Golden Agri-Resources, the company that he joined almost two years ago, is the largest private palm oil company in Indonesia and the second largest in the world. They have around 500,000 hectares of plantation, which is 4% of the total plantations in the country. They have a total of 180,000 workers, which includes 67,000 affiliated small holders and 40,000 seasonal workers.

In Indonesia, palm oil plantations are very fragmented. Almost half of them are owned and operated by small holders, so about 4 or 5 million hectares are run by about 2 million independent small holders. While Golden Agro-Resources can produce about 5.6 tons of crude palm oil (CPO) per hectare per year, smallholders typically manage only two to three tons of CPO. Despite this high level of productivity, Golden Agro-Resources still managed to commit to no deforestation. They have been doing it for ten years. Thus, sustainability for the sector needs to be addressed more at the level of the smallholders, who are not doing as much.

Purnomo pointed out that certification under the Roundtable for Sustainable Palm Oil (RSPO) is getting more and more stringent. They suspended a number of big companies and created serious threats to the marketability of the products of those companies. However, the other 40-45% plantation areas need to improve their productivity, and the only way to do that is by improving their seeds, which in turn requires financing in the realm of more than $10 billion.

Purnomo explained his involvement in financing discussions with European banks over the past two years, and none of it came to any realization. This is because of the realities of the smallholder farms. To assist smallholders financially, the facility needs to cover a subsidy for the living cost of the small farmers for four years. This is because palm oil does not produce fruit for its first four years. Purnomo explained that land tenure has to be 12 to 13 years, and the interest cannot be at the current commercial rate because it will take a long time for them to repay.

Multilaterals like the ADB could play a role in mitigating risk, which could help address the combination of lower interest rates and long tenure. Purnomo gave the example of the Tropical Landscapes Finance Facility, which had just been announced the month before. While Golden

Agri associates are supposed to be the pilot project that will facilitate financing for the small holders, they still need assistance from ADB or other investors to enable the financial sector to provide loans at 8% or 9%,

He also warned about “Coca-Colonization”, where the whole world is addressed by one single approach. Every small farmer has their own local ecosystem, local concerns, and local needs. Thus, Purnomo believes that we need to move beyond working with big brands.

Question #1: *Dunn next turned to questions coming in from Pigeonhole. He passed on a question about challenges in investing in natural capital and how they can be overcome. Dunn asked each of the panelists to address this question.*

Tregidgo stated that his key challenge is scale. He shared that he has looked at projects for small island sovereign states that promised strong measurable environmental outcomes and also strong returns. However, institutional investors are not interested unless there is scale. They are not prepared to engage in individual projects. They can be convinced of the return, but the time and resources they would need to dedicate is too large compared to the scale of the opportunity. To address this challenge, Tregidgo suggested developing a fund around small-island states. This fund could address issues around coastal preservation, with metrics that could be put together to expand the scale and to engage institutional capital.

Spitzer, as a former venture capitalist, noted that entrepreneurs who have great ideas often do not have a background in execution. Thus, he believes there needs to be an appropriate kind of convergence. There is a serious responsibility for institutions like ADB to do the right kind of training and skill building, along with aggregation of projects, to help small business get to scale.

From where he stands as a conservation and sustainable development NGO, Hibi’s biggest challenge is trying to convince corporations to change their businesses. This requires getting them out of the CSR mindset and bringing the natural capital agenda into their strategic business thinking. They are lucky if they get the environmental department people to understand, but getting the CEOs and CFOs to understand is harder. Hibi lamented that it is a long process and a lot of times, it does not come through.

Echoing Hibi’s sentiments, **Huang** expressed that it is hard to talk about environmental science or environmental impact when you are in the boardroom and when you are facing mainstream investors. The way to address this is to speak in business language. A lot of times, CSR reports are not connected to the business core. With Puma, for instance, the CEO who was serving in 2011 did not understand the sustainability program in their CSR report. Thus, Trucost took a different approach, focusing instead on their supply chain, which accounted for 80% of the impacts. Environmental risks came from the way they produced their shoes and shirts, and also from where they sourced their raw materials. They went all the way down to tier-four suppliers, where they got raw materials like cotton and leather.

Such an exercise helped inform Puma on how to allocate their resources into the right area to address sustainability impacts though procurement or design considerations. When going green allows a company to maintain the same retail price and similar production cost, consumers will make the smart choice in their purchasing decision. Thus, Hibi believes that it is important to talk about sustainability in the business context, and also to compare apples-to-apples, oranges-to-oranges. Cheap production cannot be compared with sustainable production that brings much better benefits over the longer term.

Purnomo shared that sustainability is a journey that all stakeholders must in, and there lies his main challenge. Also, there are several elements of sustainability that must be addressed simultaneously. He explained that they have 70,000 hectares of high conservation value and high carbon stock areas, and the threat comes from local authorities or communities who would like it to be converted to plantation. The nature side – protecting forest or high stock carbon areas – has to be addressed with the social side. He gave the conundrum of employing more people at a lower wage or fewer people at a higher wage. He also pointed out market issues. For instance, of the many certifications issued by RSPO, only 20% gets into the premium market. The other 80% goes to the same high-risk market that has no value. Thus, there is no connection between the producers and consumers and the complicated distribution channel of markets.

Question #2: *Dunn next asked another question from Pigeonhole about how small island states that are most vulnerable to climate change can take advantage of the opportunity to attract investors in areas such as fisheries, agriculture, and ecotourism sectors.*

Spitzer shared that Bhutan might have some lessons to offer. There is a strong focus by the government there in developing sustainable business, but they initially did not know what sector to focus on. However, by thinking in a rigorous way about where the opportunities and challenges are, they decided on agroforestry, with guidance from Spitzer. Such synchronicity is important and could be applied in the small island states. In an interconnected world, a lot of people are looking for opportunities to make money and make an impact. With small island nations, it could be fisheries, tourism, or some form of agriculture. Through discussions with institutions such as Conservation International, it is possible to think about possible opportunities and then chase those down.

Purnomo expressed his view that it is easiest to manage the fisheries sector. He believes that is the low-hanging fruit. Secondly, he suggested converting areas into plantation. If small mills are on the plantations, then the owners can take part in the whole supply chain process of agriculture products.

Hibi shared that they have been working with some of the island nations in the Pacific, which in his view are actually large ocean states. Conservation International came up with an idea called the Pacific Oceanscape. President Tong from Kiribati took the lead in taking the idea to neighboring countries, and they brought 10 more countries together to look at the entire region. The entire oceanscape covers about 20% of the ocean surface on the planet, so it is a mistake to view this area as insignificant. A big portion of seafood comes from that region, so fisheries are an obvious focus. Ecotourism is another, as each island has a different culture.

Question #3: *A final Pigeonhole question was posed to the panel about how to encourage business in the region to go beyond Corporate Social Responsibility to Corporate Social Investment.*

In response, **Huang** stated that what is valued is managed, so put a value on the impacts that are important to your business. From that, business can find and allocate the right resources to address what is needed.

For instance, Trucost has a recent project with Link REIT, which is the largest real estate company in Hong Kong. They recently issued a $500 million green bond, in which all the financing will be dedicated to green buildings, energy efficiency, and water. This is a good example of how companies are shifting from CSR to various parts of the organization, such as financing, asset enhancement, and building development, which are a core part of the business.

Closing Remarks

Dunn closed by wrapping up some key points from the session. On stimulating business investments in natural capital, the key point is that we need a rigorous appraisal to understand various opportunities and constraints, and there is also a need for a better approach for valuing environment and natural capital. Otherwise, the metrics are not there, and investors and ministers cannot be convinced that this is the right approach. Ultimately, it is about providing social and economic returns that are environmentally sustainable at the same time.

Another important point from an investment perspective is figuring out how to scale up, possibly by aggregating investments. This is a key thing for financial organizations like the ADB to look at. That is not to say that there is no need for more small investments, but there is a need to facilitate a greater number of those, as well as some of the large-impact investments moving forward.

The session also highlighted the importance of looking at business sustainability, the bottom-line for investors. A number of speakers spoke about de-risking, especially for smallholders. That is a key area where organizations like ADB and Credit Suisse can play more of a role.

To close, Dunn discussed the possible role of ADB. He mentioned that ADB is going through a process of developing its new long-term strategy, up to 2030, and a part of that involves looking at the Sustainable Development Goals. That represents a key opportunity around natural capital.

As previously mentioned, ADB has a role in de-risking and also in providing technical assistance. ADB is already doing that, but it could do more particularly around the business base. Dunn mentioned business syncopation for natural capital, which is an area that ADB could look at more.

Finally, Dunn mentioned the Natural Capital Protocol, which is something that ADB could look at to see how it could align with ADB's own corporate framework and corporate reporting, as well as looking if it offers a way to better understand investment opportunities.

Track 1B – Certification and Labels

2:30-4:00 p.m.
Auditorium B

Chair
Daniele Ponzi, Technical Advisor (Environment) and Chair, Environment Thematic Group Committee, ADB

Panelists
Madhu Khanna, Professor, University of Illinois-Urbana Champaign
Md. Fazlul Hoque, Managing Director, Plummy Fashion Limited–Bangladesh
Geoffrey Muldoon, Senior Manager, Business and Industry, WWF
June Ng Thompson, Communications Manager, Forest Stewardship Council – Asia
Sherin Lin, Vice President, Academy & Life Care Greater China, TÜV Rheinland (Guangdong) Ltd.

Ponzi started the session by stressing the importance of market demand. This is not just about consumer demands, but also business-to-business demands through the supply chain. This session explores ways for consumers and business-to-business clients to see the difference between a normal product in the market and a product which is sustainably produced and distributed.

Labeling and certification schemes allow companies – producers, distributers, and retailers – to differentiate their products. In many cases, they can sell at a premium and penetrate new markets. One of the key issues with labeling and certification is how to verify the claims that are being made, that behind the claims there are sustainable actions being taken at every stage – production, manufacturing, distribution and sale.

Other voluntary approaches are also important. These are the series of ISO codes of conducts, and other types of best practices guidance. These are often at the industry level and voluntary, but they can also be driven by government actions. Standardization processes have been helpful in the certification efforts. The consultancy business is another important trend. Many firms provide assistance to companies on certification and labeling, and this is an important kind of green business itself.

Ponzi pointed out that labeling and certification started in the 1970s. Progress has been made in a number of sectors, such as in construction with LEED (Leadership in Energy and Environmental Design) and the tourism sector. These efforts are multi-sectoral and expanding in all kinds of directions. The International Ecolabel Index estimates there are about 465 different international eco-labels in more than 200 different countries and in more than 25 sectors. This raises the question whether we can rely on such a wide universe of certification processes in place, given that there is uneven quality.

To close his opening remarks, Ponzi stated that it is difficult to target billions of consumers. He shared the approach of WWF, which selected the most important 500 companies that serve as distributors and retailers for all kinds of commodities. They found that is much easier to work through those companies, rather than to reach out to consumers directly.

Presenter #1: *Sherin Lin*

Lin started by introducing TÜV Rheinland, which is an international certification body active in 150 countries. For an organization or company, they can label its management system with a sustainability certification, like ISO 14000. For a product, they can label it with a visible mark, with the purpose of influencing the buying behavior of consumers. She explained that certification and ecolabels pertains most closely to SDG 12, which focuses on ensuring sustainable consumption and production patterns.

On ecolabels, Lin explained that labeling started in the US in the area of food product safety, and regulatory oversight expanded to health, working conditions, social metrics, and environmental impacts. Ecolabels now dominate mainly on the environmental metrics instead of social metrics. About 49% of ecolabeling bodies are not-for-profit organizations, while 16% are for-profit, and 4% are driven by government. 95% of ecolabeling requires certification. Lin explained that the driving forces behind ecolabeling include regulation, internal management pressure, and investors. Surprisingly, civil society does not rank among the top 3 pressures.

The wide range of existing eco-labels can be categorized by different dimensions.

The first is by ownership, for example, operated by a first party like Pro Planet, or by a third party, like TÜV Rheinland, which has its own labels.

The second is by regulators, like the EU ecolabel, Blue Angel in Germany, and Energy Star in the US. Some are also operated by industry associations like the Forest Stewardship Council. A third categorization is by the sector. Eco-labels are in 25 different industries, like forestry, energy, fair trade, carbon footprint, and organic sector. A fourth category is by regions.

One of the main challenges of ecolabeling is the fragmentation of ecolabels and lack of consensus on criteria. Consumers are exposed to different labels, with the purpose to enable informed decisions, but now they are left with a lot of information and this can lead to confusion. Meanwhile, manufacturers are required to get different labels, some of which are duplicative. To apply for these labels, redundant administration work is required.

Lin then introduced different kinds of certifications. The first is ISO 14001, which has a long history of development and consolidated and reliable data. There were already 320,000 certificates issued in 2015, which represented a growth rate in the last year of 8% globally. For ISO 14000, Lin believes the market size will reach $1 billion globally, only for certification costs. That provides an idea about the size of the certification industry. There are also opportunities for SME consulting companies, so this can easily come up to a $3 billion market for one single certificate, ISO 14001.

There is also a new ISO certification that relates to energy management, ISO 15001. It has a rapid growth rate, with 12,000 certificates issued last year. By 2015, that market reached $42 million, and has a compound growth rate of 128%.

Lin also spoke about new certificates, called 400 ecolabels, that were developed by TÜV Rheinland on green products. In the last four years, only in the electrical products, they issued 127 certificates. This represents about $4 billion market, only for the certification of ecolabels.

Presenter #2: *June Ng Thompson*

Thompson first provided a brief background on the Forest Stewardship Council. The FSC was founded in 1993 after the Earth Summit, and their mission is to promote responsible management of the world's forests. They are an independent, global, and non-profit membership organization. FSC works with some of the biggest brands, like Tetra Pak and Ikea, to achieve their sustainability goals. They have also received support from different environmental and social organizations.

FSC offers two types of certifications: one is forest management and the other is chain of custodies. The standards address both environmental and social issues, such as gender and indigenous people's rights. There are two types of certificates in order to maintain an unbroken supply chain, so they can ensure that the claim can pass from forest to retailer.

In the past 20 years, they have managed to certify 17% of the world's industrial round wood. Globally, they have more than 195 million hectares of forests certified in 83 countries. In Asia, they have about 11 million hectares of certified area in 18 countries, which accounts for about 6% of global certified area. For chain of custody certificates, they have more than 31,000 in 122 countries. In Asia Pacific, they have about 9,500 chain of custody certificates in 37 countries, which is about 30% of the global COC certificates.

Thompson explained that FSC sets the standards, while the certification is done through certification bodies with accreditation to do the checking. Independent auditors conduct field checks, and if the standards are met, the certification body issues the certificates. Checks are conducted annually.

The demand for certification allows FSC to set a high standard on responsible forest management. They have 10 principles and 56 criteria, and they also have locally-developed indicators, which are applicable to all types of forests in the world, including natural forests and plantations. Therefore, FSC can use a holistic perspective to consider all sorts of environmental and economic perspectives. With the labels, they can enable businesses and consumers to make informed choices about the forest products they buy.

Thompson noted that people do care. According to the 2015 Annual Global Corporate Sustainability report, 66% of respondents say they are willing to pay more for products and services that come from companies that are committed to positive social and environmental impact. For millennials, the number is 73%.

On the business-to-business side, 80% of certificate-holders say that FSC labels add value to their products, and 90% say it helped them build their positive corporate image as well. The labels also offer some tangible business benefits. Small and community producers can fit in corporate procurements, IKEA for example, because they have FSC certifications. FSC certification can be also used as a due diligence tool.

Thompson provided some examples of major corporate partners. For instance, all of Lego's packaging is 100% FSC certified, and Tetra Pak committed to use 100% FSC certified paperboard for their packaging. That is 200 billion label packages. IKEA has a long-term commitment to source all their wood from responsibly managed forests, and FSC is the only standard that they recognize. For non-timber forest products, an H&M shoe's sole uses FSC certified rubber. A lot of fashion and beauty brands have all come on board as well.

In Asia-Pacific, Peninsula has committed to using more FSC products. All of their non-finished surfaces are now FSC-certified products. Lastly, Thompson discussed their Forest Certification

for Ecosystems Services (FORCES) project. FSC is looking forward to having some products coming out soon.

Presenter #3: *Geoffrey Muldoon*

Muldoon's presentation focused on fisheries and aquaculture. He explained that, according to FAO, 90% of fisheries are either fully or over exploited.

For wild capture fisheries, production is stabilizing, while aquaculture is growing. Aquaculture is seen as important for meeting the seafood protein needs of the global population. In 2012, nearly half of all seafood protein consumed by humans came from aquaculture. In 2030, the projection is that 60% will come from aquaculture. At the same time, production in wild capture fisheries will drop by 15%.

Muldoon pointed out that in the Asia Pacific, more fish is consumed per capita than the rest of the world. Many countries in the Asia Pacific consume more than twice the amount of fish per year than the global average of 19.2 kilos, soon to be about 20 kilos of fish per annum. As with the rest of the world, capture fisheries consumption has stabilized, while consumption from aquaculture is increasing. With the population growing and per capita consumption of seafood also increasing, we need to find a way to feed everyone while still fitting within natural systems.

Muldoon explained that there has been a rise of certification in the marine seafood area. For wild-caught fish, the main certification standard, and the only one that WWF identifies with, is the MSC. There are a lot more in the aquaculture sector. Certification is a way to identify whether seafood products meet a minimum standard or threshold of social and environmental credentials. It also incentivizes producers to improve their performance and their production systems by rewarding them through access to markets and potential price premiums. The third-party aspect of certification is critical, in terms of verifying truthfulness, credibility, reliability, and fairness of the sustainability claims, so consumers do not need to do all that homework themselves.

The demand for certified seafood is primarily from North America and Europe, while the source of that seafood is primarily from the Asia Pacific. Increasingly, seafood servicing markets want to buy better products. However, only 7% of the total certified fisheries globally come from the Asia Pacific region. There are around 300 certified fisheries now under the MSC label. There is a similar picture in aquaculture, with the exception of salmon from the Nordic states and Pangasius from Viet Nam. The amount of product that is certified under the MSC logo still remains relatively small – shrimp and tilapia in particular, coming from this part of the world.

Ethical consumerism is at the heart of this, and unfortunately, the idea of certification is not yet well developed in Asia-Pacific. This is problematic, as production in the region is primarily for domestic consumption. In general, 70% to 90% of seafood that is produced locally is consumed locally.

To address this problem, Muldoon explained that they "reward the best and try and move the rest." They work with farms and marine fisheries to improve their performance, using continual improvement model. At the bottom are fisheries that deal with illegality and destructive fishing issues. These are dealt with differently than fisheries in the middle, which can be offered incentives. They do advocacy and outreach in the consumer markets to help them improve. Muldoon acknowledged that not all fisheries will improve to the level of certification, particularly in this region, but the idea is to improve on their performance.

Muldoon raised a main challenge, which is the need to produce more seafood, primarily in the aquaculture sector. To do that, there is a need to increase investment in technological innovation and transfer and also to reward improvements in productivity and environmental performance. Policies are also needed to help shift consumption habits. In Asia-Pacific, there is low receptiveness to certified seafood in local markets, so in the absence of certified products, other mechanisms are needed to promote responsible consumption and production.

In the longer-term, if there are no credible labels in the region, there is a risk that minimum standards can be diluted through political and industry influence. An important issue is cost, because cost is often a barrier to looking fully into certification, including verification. Lastly, Muldoon stressed the importance of capital to help raise the production performance we need in the coming 20 or 30 years.

Presenter #4: *Md. Fazlul Hoque*

As the Managing Director of Plummy Fashion, **Hoque** provided the perspective of the certificate recipient. He explained that Plummy Fashion is Platinum Certified under LEED (Leadership in Engineering and Environment Design), which comes from the United States Green Building Council. Platinum is the fourth and final tier of LEED certification, requiring 80 out of a possible 110 points, along with seven other prerequisites.

Only 10 factories in the world have received the LEED Platinum Certificate, and Plummy Fashion has attained the highest world-wide score of 92. The company is 40% energy efficient and 41% water efficient and produces 35% less carbon compared to any standard factory in the same field.

The Bangladesh-based company harvests every single drop of rainwater and has a natural water body inside the factory. All of their rooftops are connected by pipes to an underground reservoir. In addition, their effluent treatment plant turns wastewater into reusable water, allowing them to save half a million liters of water per day. To minimize water use, the company also uses water taps in their bathrooms that produce a maximum of 1.5 liters of water.

For energy, their indoor solar system is the biggest solar project in the country, which allows them to produce a significant amount of natural power inside the factory. For lighting, they use one thousand tubular skylights, which use sunlight from 44 skylights. Thus, there is no artificial light in the factory. The tubes bring only sunlight, not the heat, which helps keep the factory cooler. Their roof is also covered by a special type of steel that absorbs a small amount of heat from the sun. The Solar Reflectance Index is 79, which easily meets the LEED requirement of 71.

Plummy Fashion also has the most popular certification in the textile industry – Global Organic Textile Standard (GOTS). So in addition to being the greenest factory in the world, they are also producing organic products. Hoque stated that, although their building costs a lot of money, they are receiving positive responses from the leading brands across the world, providing the company with immense benefits.

Presenter #5: *Madhu Khanna*

As an environmental economist, **Khanna** has studied companies that are certified and non-certified and has tried to understand broad patterns, such as benefits and costs. She noted that globalization is helping drive the large increase in certified companies and eco-labels. In the

absence of common standards across countries, certification agencies offer standardized management and production processes for companies, along with independent verifiable methods for certification.

Khanna singled out ISO, which is based on the principle of total quality management, thereby encouraging continuous improvement in reducing pollution and waste and increasing efficiency. Encouragingly, the largest growth in ISO certification has happened in Asian countries. The region is now leading in terms of number of certificates.

ISO certification is being driven largely by the demand by these multinationals on their partner supply chains, which are based in developing countries. They want to make sure that their suppliers are responsible so there is no backlash and they can in fact claim that they are selecting suppliers that are environmentally sustainable. Foreign businesses that are located in developing countries are certified, even though local regulations might not be very strong. Because they are looking for markets in the OECD countries, they are more sustainable than they would be otherwise.

Behind the certificates and ecolabels are management practices. They are process-driven, specifying how production should take place. They are not outcome-driven, saying that you must reduce pollution by a certain amount. Thus, there is always a question whether certification really has the desired outcome, if ISO certified companies actually have a big difference in terms of their actual environmental performance. There is a lot of mixed evidence, but it does seem like ISO 14001 has had an impact in improving environmental outcomes, including air pollution, toxic releases, and water pollution.

As a note of caution, Khanna pointed out that, while ISO 14001 and many of the ecolabels are independently audited and verified, the auditors are paid by the company that they are auditing. Thus, there is a built-in conflict of interest. This has been noted in places like PRC and India, where the auditors themselves are employed by the companies, so there is concern about their independence.

Khanna also brought up the proliferation of ecolabels, which leads to considerable confusion among consumers about which labels to trust. This is especially true if there are ecolabels for the same product. One example is forestry, which has two competing labels – the Forest Stewardship Council and the Sustainable Forestry Initiative. One is led by the forestry association and the other by environmental groups. The good part of this competition is that both have ratcheted up their standards.

However, she also pointed out the downside of labels like FSC, which is a “yes or no” kind of label. There are no gradations, so there is no incentive for continuous improvement. There is thus an issue of measuring the actual outcomes of labels. While labelling processes are very costly, the measurement of impacts is not built into the labels. There are no metrics. Thus, while labels help overcome some of the limitations of weaker government regulations in some countries, there is still a lot of room left to improve them.

Question #1: *Ponzi asked Hoque whether his customers understand the LEED certification that they obtained and also what specific benefits the certification has provided to their business.*

In response, **Hoque** stated that their consumers are quite aware. He explained that in the apparel sector, they have to pass a lot of compliance, and the environment is one of them. They are ahead

of their competitors, and they can feel safe that no environmental issue will pull them back in the near future. Their buyers and clients are happy to see that they are addressing the environmental issues of tomorrow. As a result, they have access to almost every brand across the world, which is not easy in such a competitive market.

Question #2: *Ponzi then turned to Khanna about the government's role in helping support the certification business.*

Khanna believes that certification has been very much a non-government activity. It is really based on the International Standards Organization or whichever organization is issuing the label. That leads to the question about what happens when not all companies can afford certification. Many small and medium size enterprises work in the informal sector and do not have the technical expertise or the resources to get certified. Furthermore, many are not part of the supply chain, so they do not benefit from it. The government's role is with improving the environmental performance of this non-certified group.

She also stressed the importance of consumers' willingness to pay for environmentally-friendly products, as ecolabels are costly for businesses and costs are going to be in part passed on to consumers. She pointed out that billions of people are not able to afford these products. Thus, governments need to make sure everybody gets a certain level of environmental protection and also have access to safe, clean food and other products, not just those who are able to buy certified goods.

Ponzi added that there could be a role for industry associations and also consumer associations, which are not yet that strong in developing countries.

Question #3: *For the next question, Ponzi asked Muldoon about WWF's approach to target the 500 most important companies to get maximum results, specifically whether targeting big multi-nationals has proven to be effective.*

Muldoon believes that, by and large, the approach has been successful. Through its market transformation initiative, WWF identified the major players in each of the sectoral markets, so the success somewhat depends on types of commodities. There are more failures in industries that are dispersed, compared to those that are concentrated. In some cases, companies that have made significant commitments to sustainability are now finding that those commitments are not as easy to achieve as what was originally anticipated.

For instance, in the seafood sector, there are a lot of small players, and it is in those areas where the model has not been as successful. It is important to support smaller players to improve their production systems, and this requires a different approach. Muldoon stated that you can often achieve more by working with a smaller producer who is operating in a dirty way, than lifting a good performer to a slightly higher level of performance.

Question #4: *Turning to Lin, Ponzi asked about the certification market in the PRC, specifically about trends in terms of clients and sectors.*

Lin pointed out that, as a certification body, TÜV Rheinland is very close to the market. It is important that they bring value to their customers and, with the value, customers are able and willing to pay and the market will grow. In terms of certification in the sustainability sector (ISO 14000 and ISO 15001), Lin stated that these are emerging standards that are being supported by the central government and even regional governments. For example, in Shanxi Province, ISO

certifications are paid for by the local government. That serves as kind of a subsidy to encourage companies to go beyond minimum compliance.

Question #5: *Ponzi next asked Thompson about The Forest Stewardship Council's efforts at awareness and education as part of their certification program.*

Thompson acknowledged that FSC tries to do too much with too many audiences. First, to spread awareness about how their certification works, they try to share their message down to the layman level. This is especially true for smaller enterprises and land owners, as they often believe that it's a complicated and unaffordable procedure. Thompson provided the example of a Japanese woodcrafter who is FSC certified, even though he is basically a one-person business. The point is that certification is not a luxury of big brands, for companies that have environmental departments.

Second, FSC wants to educate companies, along with consumers, that the labels actually have value. They try to educate companies, their clients, that there is a meaning behind the label, and by putting that on their products, they bring positive associations to their brand.

Question #6: *Taking a question from Pigeonhole, Ponzi asked the panel about what will happen to those SMEs that cannot afford certification but that are actually close or more authentic to their vision of green business.*

To this, **Khanna** suggested that government could step in and provide technical assistance that is needed for these companies. She shared that there is anecdotal evidence at least in PRC, government is providing technical assistance, and in fact almost making it mandatory that any company that wants to trade internationally has to be ISO certified.

Muldoon shared that it depends quite heavily on what the supply chain for that business looks like. If the consumer in the end market is demanding certified products, then it could be a disadvantage or it could be penalizing a small-medium enterprise. If it makes good business sense in terms of saving money or creating value for the firm, then there is space for business to work within. The government has a role to play, for instance by providing positive subsidies to those companies to help them on that journey.

Question #7: *Another question from Pigeonhole asked whether obtaining certification and labels makes these products more special, and therefore, better able to reach a wider market.*

Hoque answered that from his experience, certification is expensive but it also gives his company some power to negotiate with clients and also access clients. He pointed out that branded and non-branded t-shirts can cost basically the same to make, but the branded t-shirt is being sold at 20 times higher prices. Thus, brands can easily accommodate the cost of certification into their pricing. He believes that customers will ultimately bear the extra cost, but the seller has enough room to accommodate this extra cost. The big question is how to motivate them. It is the social responsibility on their part to play this role and sell at the same price and to pay a little extra to the manufacturers because they have enough room.

Thompson echoed these sentiments. She believes that certification and labels probably do not make products themselves more expensive, but some brands could use it as an excuse to be more expensive.

Khanna pointed out that there are two ways certification can affect ultimately the cost and prices.

On one side, the very act of certification is likely to be more expensive. The question is whether that cost is passed on to the consumers or whether it's going to be absorbed by the firm. It is a market force. It depends on the slow pull of demand curve, how inelastic it is, and so on. However, the reason that certification and ecolabeling works is because it differentiates products, and that creates market power. And with market power, competition is reduced and prices are likely to go up rather than down.

The other side of that story is that consumers are demanding goods for a variety of attributes. Ecolabeling is one part of it, but price is also a very important determinant of demand. Thus, when you have eco-labeled products on one hand, there are other producers who are also given incentives to compete on the basis of price. They may actually lower their quality and lower their price in order to attract more consumers who care more about price. Thus, it is not necessarily the case that certification is going to lead to an overall improvement in the number of green products that are available, because producers can have differentiation on other metrics as well. One has to be cautious about what role ecolabels can play in greening businesses.

Question #8: *As a last question, Ponzi asked whether fish specifications are encompassing the supply chain to prevent losses.*

Using his experience with fisheries, **Muldoon** shared that the label does not go on the tin unless the chain of custody can be verified. That product needs to be traceable from the point it was caught or was unloaded on the dock, to the point where it reaches the final seller, before it goes to the consumer. If it does not comply with that, then it does not get the label on the can. It is important to remember that a lot of products go to the market without labels but with promises. And that is where this issue can come into play.

Muldoon gave the example of tuna. The parties to the Nauru Agreement have two types of product. One is caught free—what they call free school, so the fish are swimming freely and they are caught. Others are caught using fish aggregating devices. In order to get the MSC label, that fishery has to be able to distinguish the two, which is difficult because the same boats can use both methods. That costs more, but the market value can be worth it. Recently, a buyer in Australia decided to go 100% MSC, and is producing all their fish from that fishery.

Track 2B – Green Bonds: Catalyzing Debt Financing

2:30-4:00 p.m.
Auditorium C

Chair
Noel Peters, Senior Safeguards Specialist, Private Sector Operations Department, ADB

Presenter
"Growing the Green Bond Market to Finance Green Business: Where are We, Where Next?" by
Jonathan Drew, Managing Director, Resources and Energy Group, HSBC

Panelists
Gregory Schneider-Maunoury, Head of Sustainable Responsible Investments, Humanis Gestion d'Actifs
Christopher Knowles, Head of Climate Change & Environment Division, European Investment Bank
Atiur Rahman, Professor, Department of Development Studies, University of Dhaka
Anthony Ruschpler, Treasury Specialist, Funding Division, Treasury Department, ADB

Noel Peters started by contextualizing the importance of green bonds. He stated that, according to the International Energy Agency, a $53 trillion investment is required to meet the goal of limiting warming to two degrees Celsius. To put that in perspective, the bond market is currently around $90 trillion.

Peters reviewed some of the topics of the session: how international discussions are shaping green bonds; measures and options to help scale up green bond investment in the region; and the difficulties in mobilizing green bond markets.

Presenter: *Jonathan Drew*

Drew started by stating that green bonds are a crucial instrument to facilitate the transition from today's high-carbon economy to a low-carbon economy. He reiterated Peters' point that the volumes of required investments are enormous – up to $5 trillion per annum.

While the capacity and capability of the public sector and the traditional development bank institutions to finance that transition are significant, they only run to perhaps the tens or hundreds of billions. Therefore, in order of magnitude, we are about a factor of 100 between the funding that is available from traditional institutions and governments who have supported these types of transactions, and the amount of financing that is required. That leads to the question of how green bonds and the private sector can facilitate the transition.

To highlight the challenge ahead, Drew stressed that, while there have been many successful projects to date, the view looks worse on the aggregated global level. Society is still emitting 55 gigatons of carbon dioxide, and the concentration of CO2 in the atmosphere, currently at 404 parts per million, is still increasing at about three to four parts per million per annum. He also stated that the scientific basis of climate change is not well understood outside a relatively small community, and that the urgency of addressing the challenge and the imminence of the impact is

also not fully appreciated by many people.

Turning to the green bond market, Drew explained that there are about 130 million green bonds in issuance, and the market is growing rapidly. In particular, PRC has stepped forward to grasp the green bond as a product, as part of a broader process of utilizing the financial system to drive this transition. PRC's paper issued after the G20 summit summarized their broad and deep approach, including green equity, green loans, green bonds, green insurance, and green PPP transactions.

Another trend is the transition from the pioneers of green bonds – the sub-sovereign agencies and development banks. There is now a broader base of issuance. Corporates and commercial banks represented more than 50% of new issuance this year. This is an important step in mainstreaming green business.

Although there are positive steps, the base is still small. An issuance of a $120 billion bond is perhaps only .1% or .2% of the total capital markets or the total bond markets as they stand today. The Climate Bonds Initiative set a target of a trillion dollars of green bonds issued by 2020, which is still a fraction of the overall bond market.

Drew believes that there will continue to be a drive into private sector issuance. He also believes that the sovereigns, which have been absent as an issuer, will soon get involved in the green bond markets. It looks like that will happen in Europe, but certainly across Asia as well.

In terms of sectors, the biggest chunk comes in the multi-asset category. This is largely driven by commercial banks. A large proportion of this is the Chinese banks that have issued just this year. There are broad frameworks under which those banks will allocate the proceeds of the bond issuance. The wide range of green sectors includes energy, transportation, energy efficiency, and buildings. There are also emerging natural capital sectors where capital is increasingly being applied.

The multi-asset class effectively correlates to 49% of the labeled bonds. The larger proportion though of the climate or line bonds are issued by what the Climate Bonds Initiative have identified as the "pure-play" entities. So if you are a pure-play rail company or a pure-play renewable energy company, those bonds attract here. That universe is approaching about $700 billion.

One promising area for green bonds is mass transit. HSBC brought the Hong Kong MTR to the market just a couple of months ago. HSBC is expecting to see an increasing demand from many provincial and municipal governments in PRC looking to adopt the approach that MTR took to raising green capital. Lessons can also be learned about how to deploy the Hong Kong Rail Plus property model.

Drew also see water as another growth sector, noting that the Climate Bonds Initiative has done good work around establishing some principles around the water sector. He also believes there may be an emergence of a new type of category or a subcategory of green air, acknowledging that hydrocarbons are still going to be very important as a fuel source. Financing the transition from coal-fired to gas-fired power could ultimately facilitate a transition to much lower carbon output over time.

Also noteworthy is whether brown companies can issue green bonds. Drew thinks so, citing the example of the National Thermal Power Corporation (NTPC) of India. The company's core business is generating electric power mostly from dirty sources, but it also set up a special unit to

develop renewable energy. HSBC thought carefully before taking it to the market, but it was well received by the investor base. NTPC has now opened an offshore Indian rupee market in green format.

Another key issue, says Drew, is assurance. While some assurance methods are well established, it is an evolving process. The Climate Bonds Initiative noted some weaknesses in the so-called second opinion approach, where the ESG consultant provides an opinion on the likely environmental benefits of the actual use of proceeds. Most notably, the standards used by ESG consultants are not transparent to investors. To address this, the Climate Bonds Standards Board provided standards across key sectors to increase transparency.

Moody's then followed with their assessment methodology, which was the first big step to assess the "greenness" of green bonds. Moody's has since rated about a half-dozen transactions. Standard and Poor's, along with Trucost, is now looking to add some robust evaluation about how green bond proceeds are applied.

There are different views on these initiatives. Some people, like Drew, would like to see the credit rating agencies focus on sustainability risks and how that impacts credit risks, as that is a way to mainstream sustainability. From the private sector issuer's perspective, there are some concerns because it is yet another kind of rating.

Drew closed his presentation with a discussion about disclosure. He pointed out that green bonds are the same as any other bond with the exception that the use of proceeds are identified and allocated to eligible green investments. What that really means is that green bonds come with extra disclosure.

As a result, green bonds bring a flexible market-type approach, where players can make decisions based on information in the market. Market regulators can also clearly direct the market to support transactions where the use of proceeds conforms to the broader sustainability objectives of the country concerned. In particular, the PRC has been effective in using regulations to facilitate more prompt and efficient approvals for green transaction compared to those that are not done in green format. The PRC thus uses the green bond product as part of a system to direct capital into sustainable sectors.

As a large commercial bank, HSBC is undertaking a huge exercise to disclose not only their direct emissions, but also the emissions of their clients. This is being done under the Financial Stability Board, and under that, the Taskforce on Climate-Related Disclosure.

Drew believes that if disclosure and accounting is done right, it will facilitate a transition to what is really needed, which is ultimately putting a price on carbon. That, in turn, would facilitate taxation to be applied. When carbon is monetized, that is when the private sector can move capital to sustainable activities. Drew views the combination of carbon pricing (probably through carbon taxation) and the huge pool of capital (the $100 trillion bond market) as the true and valid way that a transition could occur.

Panelist #1: *Gregory Schneider-Maunoury*

Schneider-Maunoury started by introducing Humanis Gestion d'Actifs, which is a French asset owner. They have designed and managed a €150 million green bond fund. It is one of the biggest green bond funds in France, and the only one in France, and possibly in Europe, that measures its environmental impact.

He explained that Humanis does this because as an asset owner, they acknowledge that environmental and social issues have an impact on their bonds, and probably much more on bonds than on equity values. Like many other investors, they decided to measure their own CO2, their own carbon footprint, and the carbon footprint of their portfolio. The latter is 30 times higher than their operations, or put another way, 97% of their carbon emissions are linked to their equity portfolio.

Schneider-Maunoury explained that Humanis uses Trucost as an external, independent advisor to measure tons of CO2 avoided throughout their entire fund. They found that for every million invested, 1,400 tons of CO2 are avoided per year.

He explained that green bonds enable them to go beyond CSR, CSI, and CSP to impact investing. Impact investing measured in tons of CO2 avoided is something that can be universal, and Asia is vital since the greatest CO2 abatement potential is in Asia.

Panelist #2: *Christopher Knowles*

Knowles focused on three main topics: a brief history of green bonds; impact reporting; and the Green Bond Principles.

On the first topic, he explained that, back in 2007, EIB was the first large multilateral that do green bonds. The first five years were lonely and not helped by what was going on in the market. Starting in 2013, they began to see some growth in the market, and some institutional and bigger retailers started coming. In 2014, there was much bigger acceleration, along with the first iteration of the Green Bond Principles.

Knowles stated that EIB's stance on the green bond market has always been one of development. They do not gain anything (it actually costs them more), but they believe that it is worthwhile. Their green bond issuance over time has been less than 15% of their green bond financing, which shows that most of their green bond financing has been out of conventional brown bonds.

In explaining EIBs assistance in developing the green bond market, Knowles stressed that markets need diversification, liquidity, tenure, and the yield curve. He showed that EIB has a 21-year tenure, and also 12 years and 8 years. Thus, EIB has a yield curve not for a long term, and they also have some very big issues. They have a €3 billion issue that is due on 2019, and once a market has three billion, it feels that's a liquid issue that becomes a tradable security.

Turning to impact reporting, Knowles explained that, when EIB started detailed reporting in 2007, they initially reported only on a portfolio basis. However, starting in 2014, they started linking every dollar they raised from the green bond issuance to an individual project, and they can now report on the performance of that project to the buyer of that bond.

This detailed reporting is helpful to the marketing of the bonds. Not only can people enjoy the triple A rating of the EIB, they can also see the individual project that their dollar has gone into, and they can also see the impact that that project is generating for their dollar. Reporting is done twice a year, and buyers can now go straight to their website.

While it is complicated to translate dollars of capital expenditure into impact, there are two measures that help simplify it. First, they do it on a relative basis against a baseline scenario, so for every million Euros of disbursement, EIB is averaging 388 tons of CO2 avoided. EIB also has

an absolute GHG emission rating right across the portfolio.

On his last topic, Knowles provided a brief background on the Green Bond Principles. He explained that it's a voluntary coalition of banks, issuers and investors, and also that it builds on practices that EIB developed since 2007. It started in January of 2014 with just four banks: Bank of America, BAML, Credít Agricole, and JP Morgan and Citi. There are now 122 members and 75 observers.

He explained that it is important at this stage to keep flexibility in the market, so the Green Bond Principles should remain voluntary for now. However, they do set out best practices for issuers, and for investors, they offer a method for certification that can be understood.

Panelist #3: *Atiur Rahman*

Rahman brought a developing country perspective into the discussion. As a former market regulator for seven years, he has seen the financial market from very close quarters.

He explained that in countries like Bangladesh, the capital market is still very thin, so most of the finances are still coming from the banks. In Bangladesh, they try to nudge banks to provide green finance to small and medium enterprises, and to some industries, like the textiles. He stressed that learning from those lessons, Bangladesh should be ready to move into capital markets and raise green bonds.

Rahman explained the four critical transitions of developing Asian countries: urbanization; industrialization (manufacturing); demographic shifts (younger populations); and technological (shift to mobile). For these shifts, there are huge investment needs, and he believes that conventional bank-based investment will probably not do. Thus, there is a need to go for a bond market, and particularly a green bond market.

However, the problem for developing countries is that the conventional green market is very limited and even the secondary market is not there. There is thus a need to understand this market and to take it forward in terms of standardization, regulations, disclosures, awareness, and governance. If the conventional bond market is not well developed, it will be very difficult to even start the green bond market.

To develop the conventional bond market, and then transform part of this into the green market, there is a need to build the capacity of financial institutions and also offer regulatory support and fiscal incentives to get good results. As an example, he mentioned the Indian Renewable Energy Development Authority, which issued a tax-free, $50 million green bond in January. It has been oversubscribed by five times, because the net yield at the end of the day is much higher than the fixed depository return that they get from the bank deposit.

Rahman also mentioned the Marsala bond in India. The IFC bought the entire rupee bond and then issued the rupee-denominated bond in the London Stock Exchange, with the ES Bank. In so doing, they avoided the currency volatility risk.

Turning back to Bangladesh, he sees a huge opportunity if SMEs could be bundled. There are also opportunities for using insuring instruments (like the ERC has done in Africa) to jumpstart the green market. Last, he mentioned the potential of green sukuks (Islamic bonds), as about 20% of Bangladesh's market finance is an Islamic market.

Panelist #4: *Anthony Ruschpler*

As a Treasury Specialist in ADB, **Ruschpler** explained that ADB is a frequent borrower in the capital markets. Like EIB, they have a triple A rating, and their funding requirement for 2016 is in the range of $20.5 billion, with green bonds as one component. In 2010, ADB started becoming active in clean energy and water bonds. It issued some $900 million worth, which was mostly directed into the retail investor base in Japan.

In early 2015, ADB started its green bond framework to tackle three objectives: to diversify the investor base to a growing class of SRI investors coming out of the US and Europe; to raise cost-effective funding from the capital markets; and to raise the profile of ADB's green activities.

Eligible projects include those that provide the transition to low-carbon and climate resilient growth. These include renewable energy, solar, geothermal and small hydro, as well as energy efficiency-type projects and sustainable transport. ADB also includes adaptation projects in sectors such as energy, water and transport. Specific examples include a $250 million geothermal project in Indonesia and a $20 million wind power project in the Philippines.

The project selection process is done in conjunction with the sector specialist and the treasury department. ADB follows the Joint MDB Report on Climate Finance tracking, as well as additional criteria as part of the framework. The net proceeds are placed into a sub-portfolio within Treasury, which are dispersed to the eligible projects when required.

For reporting and transparency, ADB releases an annual newsletter, which reports on the projects that are being financed by ADB, as well as the impacts of GHG emissions avoided, annual energy savings, and so forth. ADB also recently joined the MDB-harmonized framework for impact reporting.

Turning to the latest green bond offering, Ruschpler explained that ADB issued a dual tranche this year – $1.3 billion in three and ten-year parts of the curve. He noted that ADB was one of the first multilaterals to take such an approach. He stressed that ADB has learned from investors that pricing of green bonds needs to be in line with ADB’s regular global benchmark offerings.

ADB’s inaugural green bond transaction last year was a 10-year transaction. They had some 44 SRI investors participate in the transaction. Some investors wanted their names mentioned in the press release, which highlights that investors want to be acknowledged for participating in green bonds.

Moving forward, ADB is committed to be a regular green bond issuer (in US dollars) and is also looking at other markets, such as the Australian dollar market and local currencies in Asia. Exploring other markets could help ADB diversify its investor base and raise funds cost-effectively.

Question #1: *As the first question for the panel, Peters asked, “How do we get from where we are now to where we need to be in order to address this issue in such a short period of time?”*

Knowles offered the first response. In the next couple years, he believes that the bond market will reach a number of cornerstones from the issuers side and also the investors side. These will include new players in the market and increased acceptance of some of the Green Bond Principles, including methodologies for measuring impacts and regular reporting. However, there will be gaps in some countries, as the plain vanilla bond markets need to be established before

there are green bond markets.

He also noted that the green bond market is starting from a very small base. While the fixed income market is far and away the biggest pool of capital in the world, the green bond market is just a very small percentage of that. Getting it to just 2% or 3% would mean a dramatic increase in the currently available volumes.

Question #2: *Peters next asked a follow-up question about what kind of assistance can be offered.*

Knowles commented that even the professional money managers still need assistance with the Green Bond Principles. Making the reporting less complicated and intimidating can help bring more players into the market. The momentum built by EIB and ADB now needs to be carried forward.

Champions need to be persuaded of the financial benefits of sustainable investment. There also needs to be an increased understanding that sustainability is not just a growth story, but the only growth story. We need to move from the current situation, where prospective issuers are not thinking about sustainability because they don't see the benefit, to a situation where they fear that they are missing out on something.

Knowles believes that we are now approaching a tipping point, where we start to get private sector investment moving into the markets, and the green bond is simply a platform to help the private sector tell their story. Ultimately though, acting on climate change within the necessary timeframe, there has to be a price on carbon, which is fundamental. That goes beyond the bond market and is a much broader debate.

In addition to focusing on promoting the green bond market, it is also important to address the negative push, such as fossil fuel subsidies. In that regard, Knowles stressed that there is not nearly enough information available to investors about the risks of business-as-usual. If there had been, people would put less money into American coal and gas industry, which now has $235 billion of junk debts sitting there. He believes that disclosure has to be mandatory and improved, as this is essential if risks are going to be correctly priced and decisions are going to be taken on a properly-informed basis.

Schneider-Maunoury believes that the most important point about green bonds is that it's a market. Green Bond Principles are not a legal requirement, but instead a common understanding to set up a market. There are financing needs, and the big question is how finance is going to answer to these needs by finding interested investors.

When Humanis first started their green bond fund, they thought it would be a decarbonization tool for institutional investors, but within a year, they were contacted by private bankers because high-wealth individuals could be interested in their own decarbonization.

He is certain that, in future years, there are going to be more impact indicators than just tons of CO2 avoided, driven by competition in the market. Some green bond funds will be helpful to solve waste problems, some will be focused on climate change, and others will be diversified.

Rahman stated that you need the whole country to really go green, and for that, you need a huge change in the mindset. For that to happen, he believes there is a need for large programs for educating stakeholders, backed by ADB and other multilateral organizations.

Ruschpler supported Rahman's comments about the importance of education. It is crucial to get more players into the market, both on the buy and sell side, to help drive the market forward.

Question #3: *Acknowledging the importance of fundamentals like carbon pricing, the removal of subsides, a functioning bond market, and behavior change, Peters noted that those things will take a long time. He questioned whether the drivers of the green bond market can also wait for those things to happen, or if there are opportunities to advance the market without those things.*

Drew stressed the importance of acting now. However, he also expressed his fear that, unless there is a price placed on carbon, he does not think the markets will get there in time. There is thus a need to explain to clients about the imminence of the problem and ask them to act now to raise green capital.

Knowles commented that, as individual actors, they cannot do much about fossil fuel subsidies, as that is the prerogative of governments. Governments have political constraints, and EIB can only lobby for change. However, EIB can do something about carbon pricing if the market is not performing.

He explained that every financial investor can apply an internal carbon price, a shadow carbon price, and they can make their decisions based upon that. For instance, making decisions not on the current carbon price of $6 a ton, but instead on $30 a ton. This is something EIB has done for the past six or seven years, and they have found it to be a powerful way of driving our investment assistance towards low carbon solutions.

Schneider-Maunoury proposed that a good way to incite companies to issue a green bond is to create an end-market in the form of a green bond offer in banks.

Question #4: *Peters next asked whether or not derivatives have been developed for the green bond market.*

Drew explained that, in terms of financial returns, green bonds offer the same ability as normal bonds to hedge the same derivatives. However, he is not aware of a market where you can take financial interest in some form of sustainability outcome.

Ruschpler reiterated that green bonds generally price in line with regular benchmark bonds. Green bond offerings tend to be slightly smaller than the benchmark transactions, and they are tightly held, so liquids are just a little bit thinner. He noted that spreads perform in the secondary market a little bit more for the green bond, but it's more perhaps because the bonds are more tightly held and harder to get a hold of.

Question #5: *From audience (Paul Zaman) – A question was taken from the audience about principles of responsible investing, in particular how to stimulate more pensions funds and superannuation funds for responsible investing, as that is more mainstream at the moment than green bonds.*

Peters answered that through advocacy groups like the Principles for Responsible Investment (PRI) and the Carbon Disclosure Project, there is a push for greater disclosure and understanding of underlying risk. They point at asset stranding risks, such as carbon stranding and ecological stranding. He also pointed to educational and lobbying processes, which are moving ahead.

The Green Bond Principles, Peters believes, are a further step in the same spectrum. While not everyone is going to follow those principles, the PRI can be considered an intermediate stage and has reached $60 trillion. This stage, as a powerful first signal, involves accepting some form of CSR guidance and modest levels of disclosure. The momentum is building.

Rahman shared his view that regulators have a role. Central Banks can automatically create a market by signaling that parts of pension funds need to be earmarked for green investments. However, the problem with developing countries is that pension funds are not well developed, except for civil servant pension funds. Thus, you first need to have a universal pension fund and then develop it. Rahman also believes that people working abroad from countries like Bangladesh and the Philippines care about their motherland and would be keen to buy green bonds. Regulators could help steer them in that direction.

Schneider-Maunoury mentioned that PRI launched an initiative called the Moral Carbon Pledge in 2015. Under this pledge, investors are to measure their carbon footprint in their portfolios, but once you start measuring, investors can then go further to reduce their footprint. This model is strictly inspired by responsible investment. However, Maunoury pointed out that this model does not need to be repeated everywhere. In Asia, it might be possible to skip CSR and go directly to connecting green bonds with impact investing.

On the question of mainstreaming, **Drew** highlighted the importance of disclosure. This involves issuers putting out how they are addressing the fundamental risks that their businesses are facing, including the sustainability of their transition to a low-carbon economy. The green bond is nothing more than additional disclosure masquerading as a new product or platform to tell your story.

Question #6: *From audience (Dewi Bramono, APP) – While there are many examples of green bonds for projects such as alternative fuels, renewable energy, and energy efficiency, are there any green bond projects related to deforestation and peatland management?*

Knowles acknowledged that EIB and other players in the market were initially more comfortable in the renewable energy and energy efficiency space. For these areas, it was easier to do impact reporting and ring fence assets. Thus, standards were worked out first in those sectors.

He mentioned a document sponsored by HSBC and produced by the Climate Bond Initiative. The document provides a sector-by-sector status report about the application of different standards. Such reports are out for low carbon transport and water.

Peters provided an example of the Victorian government, which did a combined bond for mass transit, renewables, and water. She also shared that if you can identify a project, take it to an organization like the Climate Bond Initiative, and request a standard, it is possible to drive the creation of that standard. And once the standard is there, you can issue the bond, provided that there is a market.

Schneider-Maunoury pointed out that the IFC has issued green bonds specifically on REDD+ projects, and one was related to Asian forests. There is also a European entity that is working with Indonesian stakeholders to set up a green bond on forest management.

Question #7: *From audience (Tim Bennet, Manage Growth in Australia) – Related to the previous question, the audience member asked specifically about green bonds for funding more sustainable farming systems, where carbon sequestration is incorporated in the process of productivity. He also pointed out that debt does not always suit these sorts of things (as coupon*

requirements on a regular basis are not necessarily well-aligned to nature) and asked if there are opportunities for quasi-equity in these sorts of sectors.

Drew answered that it really comes down to complexity in the agricultural sector. There are not many agricultural players fitting into the category of high investment grade bonds that the green investor base is looking for. However, Drew believes that there is no reason why the agricultural sector should not be an active issue into the green investor base. He believes that the constraint is willingness. For instance, Indonesia prefers to manage the sensitive palm oil sector through certification, and add an additional layer of complexity in terms of reporting that separately to investors.

On the equity component of the question, **Knowles** stated that EIB put a lot of money through equity funds of one kind or another to the sustainable land use space. The standards they apply are exactly the same, and this has been imported into the Green Bond Principles. They do not look at anything different, although it is slightly less commoditized, because it tends to be more individually structured operations. However, the underlying principles of sustainability, reportability, measuring, and managing are similar.

Question #8: *From audience (Shing Jing Ju, World Research Institute) – The audience member mentioned recent Chinese policy measure to encourage mutual opening of capital markets to issue green bonds. The participant pointed out that Chinese companies could easily go to London to issue green bonds, but for smaller countries, it's a problem. The question is thus about the preconditions for mutual opening of a green bonds market.*

Drew expressed that the challenge, which is not difficult to overcome, is to conform to global standards. For PRC, there are three regulators of different parts of the capital markets – NDRC, PBOC, and NATHME – and all of them have slightly different green bond statements. A standardized approach around the Green Bonds Principles would help.

For the global capital market, for international banks, there are licensing restrictions on who can do business in the PRC markets. Thus, there are issues around the globalization of those markets and the ability for foreign issuers to tap into Chinese capital. These issues go way beyond the green aspect.

Question #9: *From audience (Lawrence, Pro-Environment Consortium) – On the cost of bonds, the audience member asked whether mechanisms provide lower cost for refinancing through bond structures. A second question was about increasing the volumes for green finance, and about whether the lack of consciousness about urgency of the problem is the main stumbling block.*

On the second part of the question, **Drew** agreed that lack of consciousness is the problem. On the first part of the question, on pricing, he explained that the pricing proposition for green bonds is at the date of issuance. They price along the yield curve of the issuer, so the pricing is fundamentally the same.

Drew pointed out that there is some evidence that some come in a bit cheaper, some come in a bit wider, but the economic proposition of a green bond from an issuer's perspective is that you get your green story out there. That will then be monetized over time as the bonds start to trade tighter than your peers who do not have a sustainable story and who are not engaging investors the same way. So when you go back to the market in the future, you will wish you had lower yields, lower coupons.

The proposition to the investors is that you buy the green bond on day one, and you get the greenness for free. So the market is not pricing it, but that is attractive to investors, as the bond will outperform other bonds that, on date of issue, may have looked equivalent.

Ruschpler stated that ADB finds green bonds to be quite cost-attractive. They tend to be issued in smaller size than regular benchmark transactions, and they come in line in terms of pricing with the regular benchmarks. For regular bonds, that kind of small size would require paying up a little bit for it, so there is a bit of improved pricing with green bonds because of the smaller size.

ADB also issues green private placements as well, and those do give ADB much better cost of funds than the benchmark curve. Private placements by definition are much smaller in size, so public benchmarks are needed to ensure a big enough green bond portfolio.

Closing

Peters closed the session by stressing that there are structural impediments in the green bond market in developing member countries, and also generally in the bond market. These may well depend on a price on carbon and things like fossil fuel subsidies, but these should not stop the progress of the green bond market.

An important take-home message is that green bonds are not a new asset class. They are already there. It is just a matter of labeling, and in many cases, it is very easy to label these asset classes.

Green Finance in Action: the Experience of People's Republic of China

4:30-6:00 p.m.
Auditorium B

Chair
David Boland, Environmental Economist, East Asia Department, ADB

Panelists
Shouqing Zhu, Senior Associate, Sustainable Finance, World Resources Institute
Lyu Shaoyang, Vice General Manager, China Energy Conservation and Environmental Protection Consulting Co. Ltd.
Chaoni Huang, Head of Business Development, Asia, Trucost
Cheng Feng, China Industrial Bank

Presentation #1: *Shouqing Zhu*

Zhu's presentation focused on the path PRC has taken to design its green financial system.

He started by defining green finance, which is important because the definition determines where the money will flow to. In the G20 Green Finance Synthesis Report, "green finance" is defined as financial investments that provide environmental benefits in the broader context of environmentally sustainable development. Zhu believes there are two important elements of this definition. One element is the money that is moved to green sectors. The other is the system of policies, regulations, tools, and instruments that can collectively move the economy on to a green growth path.

PRC views the green financial system as a priority, both because of climate change and environmental degradation. It is also a priority because PRC's economic growth has been slowing down over the past few years because of overcapacity in traditional and polluting sectors. Thus, PRC needs to restructure its economy to become more service-oriented and high-tech. Green finance could help PRC to achieve this goal.

Zhu reviewed a number of problems in the current financial system, as follows:

- The costs and benefits of economic activities (externalities) are not priced in, not internalized in the pricing system. An example is subsidies for fossil fuels.
- Banks are not willing to make loans for long-term sustainable infrastructure projects, because of the maturity mismatch issue.
- Socially-responsible investors do not know which companies to invest in, because of lack of information.
- Investors do not have the reference data or the analytical tools necessary to assess investments in green projects.

A green financial system can address these problems in a number of ways, and these could help drive changes in peoples' mindsets and behaviors. First, on the fiscal and taxation side, subsidies for fossil fuels could be phased out, while subsidies for green products could be phased in. On

the legal side, information disclosure could be made mandatory, along with environmental insurance. Banks could also be made accountable for the environmental damage of the companies they lend to, a concept referred to as “lender’s liability.”

Zhu also mentioned that new financial institutions, such as green banks and green funds, could be established. Financial instruments such as green bonds and carbon market instruments could also be developed. Another measure could be to make overseas investments more environmentally friendly.

Over the past year, PRC has taken action to change its financial system. Three Executive Orders formed the legal foundations. The first is titled “Opinions of China Central Party Committee and the State Council on Accelerating Development of Large Ecological Civilization”, which was released in March 2015. The second is titled “Overall Plan for Structural Reform for Ecological Civilization”, which was issued in September in 2015.

A couple of platforms were also established. The first was PRC’s Green Finance Task Force, which was set up by the People’s Bank of China in August 2014 to design a roadmap for reform. A second platform was set up by the China Council for International Cooperation on Environmental Development (CCICED). A number of task forces are also formed each year to provide advisory advice or policy recommendations. In August of this year, a document that summarized the policy recommendations from these task forces was released. The document is called “Guidelines for Establishing Green Financial System”.

At almost the same time, the People’s Bank of China partnered with the Bank of England to set up a green finance study group within the G20, which PRC chaired. This study group released a report entitled the “Green Finance Synthesis Report.”

All the platforms and task forces provided policy recommendations for a green financial system. At the same time, a bottom-up movement occurred led by think-tanks and civil society organizations like the World Resources Institute, International Institute for Sustainable Development, WWF, Oxfam, and Greenpeace. These organizations worked with the government to provide policy recommendations.

The private sector also joined in, including industry organizations on banking, on asset management, and on insurance. Some banks are also serving as champions, such as the Industrial and Commercial Bank of China (ICBC). Working with Trucost, ICBC developed models to stress test their low-end portfolios.

Another notable milestone is on the green bond markets, which took off last year. The People’s Bank of China and the National Development Reform Commission (NDRC) developed guidelines on green bonds that helped with this process.

Turning to upcoming measures in the next five to ten years, Zhu introduced seven groups of actions.

One group is to change the banking system, which has greatly increased green lending. Other measures in this group include using the Central Bank for lending, developing a specialized guarantee mechanism, using fiscal subsidies on interest payments, and adjusting the prudential regulations for green products. The government also plans to roll out stress testing in the banking sector, introduce lenders liability for the banking industry, and encourage securitization of green assets.

The second group focuses on enhancing the role of the securities market. That includes harmonizing the green bonds derivatives, along with the already-released guidelines on green bonds. There is a need to harmonize the guidelines and also to prioritize green business IPOs. The government also encourages the development of green bond and green equity indices. Last, to allow venture capital to exit from funding SMEs, there are plans to let SMEs issue stocks on the stock market.

The third group of actions is intended to use green funds to mobilize social capital through public-private partnerships. These actions include: setting up green development funds on the national, provincial and local levels; bundling projects so developers have an incentive to invest in green sectors; and using more profitable projects to benefit less profitable projects.

The fourth group is to develop green insurance. That includes establishing a compulsory environmental pollution liability insurance system, and supporting innovation in green insurance products and services.

The fifth group is centered on an emissions trading system (ETS). PRC now has ETS pilots in seven cities and provinces, and the plan is to integrate these into a national emissions trading system. In addition, new carbon financing instruments will be developed, such as pollution emission rates, energy use rates, and water rates, which will all be traded.

The sixth group is related to green finance at the local level. Provinces will be encouraged to develop green funds, while the Central Bank will provide lending guarantees to support these funds.

The last group focuses on international collaboration. While the chairmanship of the G20 has moved to Germany, the People's Bank of China will continue to chair the G20 Green Finance Study Group. In addition, PRC wants to green the Belt and Road Initiative.

Zhu ended by summarizing three main points. The first is that the PRC government has taken a leadership role in generating green finance. The second is that the private sector and civil society have supported the government's initiatives. And third, international cooperation has been key in providing lessons such as lenders' liability. Continued international knowledge sharing and peer learning is important.

Presenter #2: *Cheng Feng*

Feng's presentation focused on the Equator Principles, with attention to green finance.

He first mentioned that PRC is paying a lot of attention to water and air pollution, and there is a growing market for environmental protection for companies and banks. The government also encourages banks to lend money to companies that specialize in environmental protection.

In 2007, CVRC issued a document to limit banks that provide capital or money to companies who are causing high-energy consumption and high pollution. In the same year, CVRC worked on a document named Credit Guidance, which was meant to support companies with energy conservation and clean energy use.

In 2012, CVRC again offered green credit guidance to banks to adjust their organizations, processing and internal controls, and information disclosure. PRC also introduced environmental

protection finance. Banks are required to submit a self-evaluation of their green credit and should submit a report at least annually.

China Industrial Bank (CIB) was the first bank in PRC that committed to the Equator Principles. They are still the only one in the mainland of PRC. The idea of integrating righteousness into profitability goes all the way to the top of CIB management. That means that they only lend money to those who are not polluting nature.

CIB's Environmental Financing Department operates their green credit program. They provide financial products like the Environmental Protection Project, Saving Project Loan, and the Green Finance Product Innovation. They also provide the controlling laws to industries with high-energy consumption and high pollution, and provide the one-vote negotiation system. The department also pays attention to the sustainable development of CIB and its companies, including enhancing the company's risk management capacity.

Feng explained that CIB has been operating green credit for 10 years, and they have a leading position in PRC's banking market. CIB has two professional teams in its headquarters. The first is a team with post-energy and environmental engineering experts. The second is a team with legal, accounting, and financial experts. They also have the Professional Green Finance Center, where they have product managers of green finance.

The Environmental Finance Department, where Feng works, manages clients in a number of industries including water, resource utilization and protection, environmental infrastructure, environmental management, resource recycling, and clean and renewable energy. The current environmental financing is 430 billion Chinese Yuan, and six thousand companies have been supported. The most prominent industries are water resource utilization and generation, and clean and renewable energy.

Green finance means mostly low-profit and long creditable periods. They have consciously issued green finance bonds for projects over the past two years. In 2015, they issued about 20 billion Chinese Yuan, and this year, they issued about 50 billion Chinese Yuan.

The Environmental Finance Department implements a number of measures to encourage green credit to companies that are in environmental protection. First, they provide cheaper financing to the companies that are protecting the environment. Second, they can authorize CIB's business branches to manage credit approval of green finance projects. Third, they also established a comprehensive evaluation and incentive system to promote the production of innovative, green finance products and services. Feng's department can now measure the environmental benefits of green finance, including energy savings, water savings, and emissions reductions.

Question #1: *Boland turned to Chaoni Huang to explain about Trucost's approach towards identifying company risks and dependencies on natural capital.*

Huang first explained why Trucost's unique and quantitative approach is important. For banks and investors, it is vital to understand the environmental risks they are exposed to through their lending and investing activities. At the same time, it is equally important for companies to understand the environmental risks they are facing today, so they can adjust their business models and strategies.

For that reason, Trucost helps companies understand environmental impacts better, and not only in physical environmental terms, such as tons of carbon emission or cubic meters of water used.

Instead, they translate these impacts into business intelligence, including effects on the top line and bottom line. That then helps businesses decide on how they should adjust their product design, supply chain, procurement strategy, and core business strategy.

For example, Trucost conducted an analysis last year of 32 exchange-traded cement companies operating in PRC. They found that these companies contributed $31 billion worth of environmental damage. If all these environmental damages were internalized, it would wipe out 70% of the revenues.

Huang asserted that this internalization is not hypothetical, as there are increasingly stringent pollution control policies and higher awareness among society, governments, and investors. Another driver is big banks like IBC, which has trillions of dollars of assets within their balance sheets. As mentioned earlier, they are undertaking stress testing for environmental policies affecting different sectors like steel, cement, and thermal power. Thus, companies really need to reconsider the way they are operating now.

Question #2: *Boland next asked a question for panelist Mr. Lyu about his organization's role in developing a climate-aligned bond index with the Climate Bonds Initiative. He also asked Mr. Lyu to describe some of the emerging challenges from green finance reforms.*

Lyu started by providing some background on his organization. With the company slogan of "Investing Green, Going Green", CCP is the largest state-owned enterprise in green investment and is also an issuer of green bonds. It has total assets of about 150 billion RMB, and annual revenue of about 48 million RMB. At present, per year, it will finish investments of around 20 billion RMB.

All their investment is 100% related to green investment, such as energy saving, energy dependency, environmental protection and renewable energy resources. Per year, CCP produces nearly 10 billion green power, and it has processed about 7 million tons of solid waste and about 600 million tons of water.

Lyu explained that to meet the demand of their market green investment, CCP has to make use of green finance. On credit lending, total credit is almost 300 million RMB from many banks, and in green bonds of CIB, 5 billion RMB this year. Thus, the cumulative bond has reached more than 50 billion RMB. In addition, the local government has established a green industry of more than 20 billion RMB for the equity investments.

CCP also cooperates with international financial institutions in setting up green funds. For instance, CCP cooperated with ADB to establish green funds to support investment in air pollution around Beijing, Hebei, and Tianjin, and it will go into operation next year.

Lyu believes that cooperation is beneficial to forming a consensus on green bond standards, and that will help investors understand the green market and increase their confidence. He noted the difference in standards between developed and developing countries. Developed countries are more concerned about climate change, while developing countries, apart from climate change, also suffer from environment degradation.

Question #3: *Boland turned to a question from Pigeonhole about what advice could be given to other countries trying to follow PRC's model.*

In response, **Zhu** stressed that big countries and smaller countries are different, but to enhance

economic development, they all need three basic things. The first is the right enabling environment in the form of policies and regulations that enable the business community to invest in those sectors, and also to provide incentives for investors.

The second is money, and that is the difference between PRC and smaller countries. Citizens in PRC are very conscious about saving money. They put their money in the banks, so there is plenty of capital. Smaller countries often do not have this supply, but through the right policies, they could attract foreign investments. Also, as long as they have the right criteria to evaluate, monitor, and report on green bonds, countries could issue green bonds in other countries as well.

The third element is technology. Smaller countries may not have so much technology in place, but again, by encouraging foreign investment, these countries could also introduce new technology into their countries.

Huang emphasized that countries need to take effective steps to mobilize capital towards green areas. He noted that a lot has happened in PRC in the past two years, all due to an effective top-down driven approach to streamline the capital market towards greening. He believes there are important lessons for other countries of different sizes and development phases.

He pointed to some good progress in Singapore, which up to now has not been strong in green finance. This change is being driven by the Singapore Exchange, and this pressure is putting them on the right path. It is these types of effective steps, not necessarily large steps, that are important.

Scaling up Investments in Green Businesses – What Can Be Done to Support Green SMEs?

4:30-6:00 p.m.
Auditorium C

Chair
Armin Bauer, Principal Economist, Thematic Cluster, Sustainable Development and Climate Change Department, ADB

Panelists
Zuraina Zaharin, CEO, Eco Loo
Risa Gama Siregar, Co-CEO, Rubysh Jewelry
Paolo Limcaoco, Investment Associate, Southeast Asia, LGT Impact Ventures
Alka Upadhyay, Assistant Vice President, Tata Sustainability Group
Maricen S. Jalandoni, General Manager Base Bahay Foundation, Inc.

Question #1: *Armin Bauer asked Zaharin about the main reasons why her company, despite having a lot of interesting products that are in demand, is still so small, with a turnover of roughly $1 million.*

Zaharin explained that her company, Eco Loo, experiences many challenges as a start-up company. They were established in 2013, but it was only last year that they focused on marketing in Malaysia (even though they have an office there). Before that, they had been marketing to more than 17 countries, and had managed to sell to all those countries.

The first key challenge is acceptance and understanding of sustainable toilets and why there is a need for them. The company was started in Sweden nine years ago, with the goal of addressing the issue of sanitation, the 2.5 billion people in the world who have no proper access to toilets and hygiene. Their toilets are eco-friendly, odor-free, water-free, sewage-free, and energy-free. The urine is treated and turned into fertilizer. It is full of nutrients as has no smell or pathogens.

They started to expand the business by manufacturing with fiberglass, but they realized another challenge was with the pricing. Most of the demand is coming from developing countries in Asia, Africa, and South America, so price is an issue. Thus, they started producing in Malaysia, which is cheaper than Korea.

In Malaysia, they then needed to deal with the government accreditation bodies, which had questions about who would buy the toilets and if they were sanitary. They are now trying to convince the government by starting some pilot projects.

Zaharin stated that another challenge is funding – trying to raise grant funding from governments. The United Nations named them among the Top 10 solution makers, but they are still seeking funding from ADB and others.

Follow-up Question: *Bauer suggested that one way companies like Eco Loo could secure more funding and expand their markets is to participate in government procurement programs, along with bringing down their prices. The challenge for small businesses, Bauer stated, is that the*

product might be good from an eco-perspective, but it is too expensive to scale up. Bauer asked if Eco Loo could quickly scale up while offering cheaper products.

Zaharin responded in the affirmative. She stated that cheap can sometimes mean expensive. Lack of adequate sewage treatment means that waste ends up in the seas and rivers and eaten by fish, which is consumed by people. As an alternative, Eco Loo's toilet byproduct is fertilizer that can guarantee income, with payback in one to three years' time. This helps the users of the toilets. Also, the maintenance is almost zero. It costs only $25 a month for the bacteria.

Question #2: *Bauer next turned to Jalandoni, whose company builds bamboo houses that sell for about $5,000 a house in the Philippines. Bauer asked how the idea started – from the Base Bahay Company or in response to Typhoon Yolanda.*

Jalandoni explained that the idea came before the Yolanda storm. It came out of a masters' thesis of a German engineer, who was working with the Hilti Foundation. In 2012, she undertook a pilot project in the Philippines and the Hilti group approved it. Shortly after, Yolanda struck, and the houses were built as part of the disaster recovery.

The Base Bahay Company is now building about 250 houses per year, with the support of the Hilti group. The houses are disaster-resilient – they can withstand both earthquakes and strong typhoon with up to 250-kilometer per hour winds. Thus, the pricing is slightly higher compared with socialized housing, but in terms of quality, they are comparable to a conventional housing system.

Right now, Jalandoni noted that the price is very competitive compared with conventional construction. However, to cater to the socialized housing segment, they have to bring down the price and this will require going to scale. For this, they require a steady supply of good quality bamboo.

One of the challenges of scaling up in the Philippines is that while there is a lot of bamboo, the supply is not stable. There are no organized plantations, and also no accurate data about where bamboo is located. Thus, scaling up will require encouraging people to plant more bamboo, which is good for the environment. It grows within three to five years, requires little maintenance, and can be harvested without killing the plant.

Another challenge is that bamboo is not recognized in the national building code. Once it's in the code, as an acceptable material for alternative building systems, it could be more easily offered to higher income levels. They have also passed their system to the I-Tech, which is a group that accredits initiative technologies for housing.

Follow-up Question: *Bauer observed that the issue is chicken-and-egg. While there is an unsteady supply of bamboo, the private sector will not invest in supplying bamboo because they are not sure if there is a big market. Bauer asked Jalandoni if her company could scale up to 1,000 or more by instead focusing on the middle and upper income markets and if this strategy could be done to help expand the environmental benefits.*

Jalandoni stated that given the lack of high quality bamboo, they can only produce up to 350 houses currently. She further explained that there is a large market for barbeque sticks in the Philippines, and these require young bamboo (one year only). In contrast, her company requires more mature bamboo, which they can treat to prevent from cracking.

To address this problem, the Base Bahay Company is talking to people with idle land and encouraging them to plant bamboo. She explained that, in addition to construction, there are a lot of uses for bamboo, including furniture and clothing. They are also helping to set up treatment facilities, which are also lacking in the Philippines.

She agreed that they could scale up by targeting other income classes, but pointed out that they work for a foundation and aim to provide housing for the poor. However, expanding the market would be a good business strategy for anyone who might want to make it a business. For the business to work, the middle and upper income classes would have to be convinced that bamboo is a quality product that can be used for housing, as many of them still go for steel and concrete structures.

Question #3: *Bauer next turned to the audience for questions, and both Jalandoni and Zaharin were asked if they could upscale if they linked more closely to the tourism sector.*

Jalandoni commented that they had already been approached about building bamboo villages for tourism. They are willing to undertake the work if the villages do sustainable livelihood programs, if there is a social housing aspect to it.

Zaharin pointed out that they have installed 10 units at a UNESCO heritage site in Jordan. The site had received a yellow card for not being sustainable and turned to Eco Loo. They could not rely on a conventional system, so Eco Loo helped solve their problem. They are now ordering more.

She pointed out that, especially in tourist areas where septic tanks cannot be built, their toilets can offer a solution and also help generate money from the sale of fertilizer. They plan to scale up by manufacturing with composites. Their long-term plan is to establish a manufacturing plant in a local community, which can provide further business and job opportunities.

Question #4: *Bauer asked Siregar about her business in Indonesia, which involves making jewelry out of plastic trash.*

Siregar started by providing a snapshot of her company, Rubysh Jewelry. It was first established in February 2015. Based in Bandung, its main focus is to upcycle in organic ways, such as plastic or textile shirts into fashion products. The initial annual goal is to earn 105 million rupiah, which is about $10,000.

She explained that, for now, they have 20 women employees that produce the jewelry. For the collection of materials, they collaborate with two different types of suppliers. First, they work with local waste collectors who collect waste from residential areas and smaller industries. Second, they coordinate with Waste Bank, which is a small organization built by local people to facilitate collection of recyclables in their communities. These local people regularly bring recyclable wastes to Waste Bank and receive a certain amount of money which they deposit, just like a banking system. Thus, for a small business that makes only $10,000 annually, they support a number of people in their value chain.

To scale up, Siregar believes they could either open up branches in another area without expanding their operations, or they could increase the number of their employees, so they could make more products. To enlarge their market, they need to address the quality of the jewelry, as they still make them all by hand. They are waiting for a special machine to help improve the quality.

Question #5: *Bauer next asked Limcaoco how his company, LGT Impact Ventures, could potentially assist small companies such as these from the finance side, given that they typically target larger companies.*

Bauer first explained the difference between being profitable and bankable. The latter is a higher bar, as profits must overcome the rate of interest. While a company can be profitable with 1% returns, a bankable company needs to have perhaps a 10% return. Bauer mentioned "angel investors", which are willing to accept lower returns and can also help small businesses in developing their business plans.

Limcaoco noted that only after developing a strategy can a business come to investors and other funders with a business plan. They have to know their market and business model first.

He explained that LGT Impact Ventures is a group of global impact investing firms that support SMES by investing between $1 million to $10 million for a minority stake. For the smaller businesses represented on the panel, they might first try to connect to funders that do smaller investments. He gave the example of Rags 2 Riches, which over the past seven years, has grown their business of artisanal crafts with women using sustainable materials.

Question #6: *Bauer again turned to the audience, of which many came from the small business sector. He asked if issues such as potential markets, business plans, and product costs were problems for them.*

One audience member responded that they did not want money at the early stages of developing the company. Receiving money requires giving away a lot of equity and also losing some control over the business. Instead, the audience member preferred to grow the company to a sustainable level first. The challenge is growing to a certain level through self-financing, so that the company is strong enough to have bargaining power.

Question #7: *Bauer pointed out that there can be a contradiction between doing good for the environment and doing good for the poor. Products that are good for the environment are often too expensive for the poor, so companies sometimes must make a strategic choice, either lowering the price of the product for the poor (and perhaps limiting their market), or targeting a higher income bracket to expand their market and environmental impact. He asked the panel to comment about making a choice between green business and inclusive business.*

Limcaoco explained that LGT Impact Ventures was set up to improve the peoples' lives, making good use of money to help people gain a little more prosperity. Thus, their focus was more on inclusive business. He believes that it is possible to tweak the business model or strategy so that business can both be green and inclusive, and expressed optimism that such a choice will not be needed in the future.

Jalandoni reiterated her view that they are a foundation and thus not able to make money. Their mandate is to help the poorest of the poor. However, SMEs can get into certain areas that can supply their foundation, and there are good business opportunities there. To assist these SMEs, the foundation has consultants that work with bamboo, not only as a construction material but as a material for fabric, flooring, food, and charcoal. There is also a business for those who want to get into treating bamboo.

Question #8: *The next question was for Upadhyay. Bauer asked about what kind of green*

businesses Tata is supporting.

Upadhyay first spoke about Tata's Affirmative Action Programme, which has been running since 2007. It seeks to include the marginalized populations, called Schedule Castes and Schedule Tribes. They are providing four things: education, entrepreneurship, employability, and opportunity.

He explained that the idea is to make people employable, to make sure the basis is on merit. There is also an emphasis on encouraging entrepreneurial attitudes, so Tata can establish vendor relationships. This is already happening, as Tata is employing 350 ACST entrepreneurs as their vendor partners. Almost 8% of their employees now come from ACST.

Upadhyay then provided a number of examples of Tata's environmental and social initiatives. On the environment side, he mentioned the Nano, which was originally marketed to people who could graduate from scooters. However, Tata found that people did not want a "poor people's" car, so Tata is now repositioning it as a "city class car" with more attributes. This includes the lowest tailpipe emission of 90 grams per kilometer.

Another example comes from Tata Chemicals, which came up water purifiers that can be connected to taps. Tata Chemicals also came up with a business using solid ash from western parts of India. There is now a cottage clothing industry involving women, and they have gone online to sell their products.

Other Tata green projects are community-based. For instance, community-based water ATM can serve 300-400 people in villages. It is based on simple reverse osmosis. Another initiative that is more focused on inclusiveness is from Tata Global Beverages, which is assisting the spouses of tea workers to weave shawls.

Upadhyay stressed that they are profit driven and do not compromise on merit. By merit, they mean three elements – quality, price and delivery time. While they may be in a position to try pilots, their businesses must be self-sustainable.

He also stated that knowing your customer base is important. For products that have an environmental benefit, the target is those creating the nuisance, which is typically the rich. Products for the poor have to be affordable. They cannot be sustainable with funding and more funding.

As a final point, Upadhyay recommended that all business do a stress test for their products to assess if there is a real demand. On a simple level, they should ask themselves if they themselves would buy their products if there is a choice among other options.

Question #9: *The last set of comments centered on the possibility of setting up a fund to help support smaller green businesses that are at the startup phase.*

Gelber pointed out most clean tech funds, such as those from Tata, are interested in companies that are at a more mature stage because there is less risk and a defined business span with higher returns.

Thus, he believes that we need to look at how to frame a fund. It might be possible to have a fund for those companies that need more handholding, where the fund itself supports the development of the business strategy.

For Eco Loo, he suggested that the business model could be completely changed if a big company like Tata, along with a housing developer and maybe a bank, could put up $10 million to build the toilets along with the houses and then there could be a revenue stream from the fertilizer. This model could then be scaled up and could run by itself. Gelber stressed the need to work together towards an integrated systems approach, and there could be interesting outcomes if such a green business fund could be set up.

Bauer made the point that to set up such a grant fund, ADB would need a bilateral donor to come up with the money, or perhaps a government to borrow money from ADB. He expressed that such a fund is a good idea, but he had tried in the past to establish one, and there was no interest on the part of governments.

Day 3, 24 November 2016

Special Session: Youth and Green Business – led by ADB-NGOC

Chair
Amy Leung, Deputy Director General concurrently Chief Thematic Officer, Thematic Advisory Service Cluster, Sustainable Development and Climate Change Department, ADB

Presenters
Zahin Hussain, ADB Youth for Asia
Gerald Tan, Singapore
Cheryl Lee, Singapore
Audrey Jalbuena, Philippines

Amy Leung started the third day by voicing her excitement about the first session. The session provides a venue for the youth to share their views on green business opportunities and also on some key challenges. She explained that the session has two components. The first is a youth road mapping exercise, and the second is a search initiative to identify innovative youth solutions in the green business area.

Presentation #1: *Hussain*

Hussain started the presentation by explaining the role of ADB Youth for Asia in the Green Business Forum. In parallel to the forum, they have been hosting a youth agenda, where they brought together youth from Asia and the Pacific to brainstorm about what areas youth could be involved in to help develop green businesses in the region. The group was composed of young professionals and entrepreneurs, students, and community leaders, who together have a range of perspectives.

On the question "What is green business?" the group had a lot of questions about how they operate, who is running them, and what sort of resources do they need. In order to better understand this complex environment, they went through what is known as the human-centered design approach, which is a five-step process to put the stakeholders in the middle to better understand their needs and come up with solutions.

Once they identified the stakeholders, they identified two to three top challenges, from which they could create ideas for solutions. From there, they built a prototype to determine whether the solution could make a real impact on the development of green business. Finally, they tested the prototype by inviting ADB experts and private sector partners to give real-time feedback.

Hussain explained that the process was quite reiterative, and it took a lot of discussions to find solutions that are most impactful to the stakeholders at the center. She then introduced the three presenters who would summarize the results of the road mapping exercise.

Presenter #2: *Tan (On Green Innovation and Technology)*

Tan started his presentation by explaining the vision of the youth towards green technology and

innovation, which focused on inclusivity. To realize this vision, there are a number of challenges, which include a lack of pre-existing green business technologies to scale up, as well as inadequate platforms to connect. There are many green businesses, yet they are disconnected.

To address this issue, they came up with an electronic platform called the Electronic Collaborative System, or E-cosystem. The platform provides three different solutions.

- The first is to connect every stakeholder through the use of an interactive map that can show the location of different green businesses and technologies.
- The second is a venue to help scale up by allowing businesses to share their technologies and their resources between each other – sort of like an Airbnb for green technology and businesses.
- The third solution is a green medal system that will award businesses or collaborative projects to help assess their capacity and how much they are contributing to the Sustainable Development Goals.

To close, **Tan** shared his view that green technology will be the next frontier and that youth can help lead the way. He gave the example of one of the Japanese youths on the team. He joined a company in Japan involving organic waste material, and he realized that it had much potential to go green. He talked to the company executives about his ideas, and eventually he brought that technology out of Japan into Africa.

Presenter #3: *Lee (On How Can the Youth Help in Creating an Enabling Policy Framework)*

Lee started her presentation by pointing out that 60% of the population in the Asia Pacific region is youth, and most youth believe that the government has the power to effect positive change. She explained that youth can be an asset for policymakers, but there a couple of challenges. First, policies are not able to meet the current needs of businesses. And second, there is indifference among youth about climate change, green thinking, and green businesses.

In response to these challenges, their vision was to empower youth through multi-stakeholder engagement, with a focus on putting humans at the center of green policy designs. They first aimed to better understand their audience, categorizing them according to age, social economic status, and culture of their country. They wanted to tap into the psyche of the youth and transform their concept of green thinking into a green lifestyle through campaigns and also social influencers that could emphasize immediate feedback.

To accomplish these things, their solution is to create the Youth Innovation Lab, or Youth I-collab, as a way to educate and promote awareness and collaborations in green businesses with multi-stakeholder representatives. The lab would serve as a digital, and perhaps even a physical, space within ADB Youth for Asia for engaging and strengthening ideas and initiatives towards creating a green business policy. It would do so through advocacy campaigns to promote sustainable and profitable businesses for their stakeholders.

Through the lab, there could be a number of focus activities. These include youth empowerment. Youth can develop ideas to help empower others in green business policy. This can be facilitated through informational awareness campaigns, such as workshops or caravans. The lab can also facilitate research through gathering youth who want to do business in a sustainable way, but need supporting frameworks to do that.

Recognizing that there are existing policies already, another crucial component of the lab is a policy scan that looks at current policies and also helps question them about how youth can

contribute to existing policies.

Presenter #4: *Jalbuena (On Mobilizing Public Sector Finance)*

Jalbuena started by pointing out that the youth make economic decisions every day, and so the growth of green businesses really depends on them. They have a huge stake to collaborate with the private sector.

She explained that one of the challenges is citizens' education. On this point, she explained that consumers are the ones that dictate demand and supply, so it is ultimately up to consumers to lead areas for private sector investment. A second challenge is the lack of a green business ecosystem in the region. There is a need for the youth and private sector to collaborate to affect change.

In response to these challenges, their vision is for the youth to be able to mobilize private sector finance for green businesses. For that, they would like to raise awareness for children and young people, by creating training-workshops for them. At the end, they could then provide consulting and innovation support. Research could be undertaken to understand more about the green businesses here in the region.

To accomplish these things, they proposed two applications. The first is a gaming app, where youth can role-play as industry managers and make choices. If users choose green businesses, they can make further choices about sustainable and efficient ways. And if users do not choose green businesses, they can see the future consequences. This application can thus help change the mindset of consumer behavior.

The second application is a social hub where green business initiatives, collaborations, and networking can be centralized. Jalbuena explained that the two applications complement each other. The first app educates and the second app offers a platform to partner and mobilize.

Feedback: *Leung and Ponzi*

Leung expressed that she is inspired by the three cases and shared that they received over a hundred solutions. It is motivating to see the passion of the youth in creating solutions and that these solutions are focused on people and making the world a better place to live. She finds the solutions to be practical and also replicable.

Ponzi agreed with the presenters that the future is in the hands of the youth, especially in Asia where 60% of the population are young people. He noted that the youth are the real source of creativity and are naturally out-of-the-box thinkers. They are also sometimes allergic to authority and bureaucracies, so they have the mindset to drive radical change.

Ponzi expressed that the youth can effectively serve as watchdogs, looking closely at what is happening on the ground, in terms of pollution and natural resource management outcomes and also in terms of the beneficiaries. They can do this not only through social media, but also because they are coming from communities and they are close to people.

Because of their use of social media and other technologies, the youth are also effective communicators in terms of being connected with people, getting the right type of messages, and having enthusiasm and passion. The youth can thus serve as a powerful message network to reach across the entire population.

Presenter #5: *Hussain (on the Solution Search Program and the winners)*

Hussain introduced the Solution Search Program, which is the signature program of ADB's Youth for Asia. It involves looking for innovative and scalable youth initiatives from across the region, and then tying those to sectors at ADB, as well as to their contributions to the Sustainable Development Goals. The initiatives can come from social enterprises or from youth organizations.

What they tried to do was keep entrepreneurship at the center of problem-solving where they could harness the energy and passion of new ideas and scale them for effective development. For over a month, they ran marketing campaigns, and in partnership with incubators and accelerators, they were able to gather 108 green business solutions in the region.

Among those 108, they selected three winners to present and showcase their solutions. It was a tough process, as many others deserved awards. Winners were selected based on a number of criteria, including innovation and potential for upscaling and replication. The process also provided an opportunity to see how ADB can get involved in youth-driven green business development.

Closing: *Leung*

Leung closed the session by congratulating the winners and all the participants, who gave a lot of thought and energy in coming up with practical solutions and business ideas on green technologies. However, more can be done to engage in changing policies through the youth.

She expressed her wish that ADB should work more with the youth, as they are change-agents. There is value in building a network of passionate, dynamic, and committed youth to leverage the efforts they have already put in, and to deepen the engagement in green business. Leung suggested a knowledge product to develop and disseminate the youth roadmap, as ADB is keen on further developing more tangible solutions.

Track 3A – Sustainable Farming, Soft Commodities, Agro-Processing, and Food Industry

9:15-10:45 a.m.
Auditorium A-B

Chair
Michiko Katagami, Principal Natural Resources and Agriculture Specialist, Agriculture, Rural Development and Food Security Unit, ADB

Introduction
Marc Buckley, Co-founder and CEO, ANJA GmbH & Co. KG

Panelists
Dewi Bramono, Deputy Director for Sustainability and Stakeholder Engagement, Asia Pulp and Paper
Pacita Juan, Owner, ECHOstore
David Conn, Papua New Guinea Chamber of Commerce and Industry

Presenter #1: *Marc Buckley*

Buckley started his introductory presentation by stressing the importance of agriculture and eating. He stated that the sector is a key part of all 17 Sustainable Development Goals. It is one of the most basic and vital needs, and yet there is no forum specifically for agriculture and food and beverage – nothing like the formal COP for climate, the World Economic Forum, banking forums, or health organizations.

He next presented a Trucost analysis done in 2012. The results indicate that there is an environmental imbalance in agriculture and food and beverage production, including the use of resources, water, and land, as well as the packaging, logistics, and marketing. In sum, the environmental cost is heavily imbalanced, because the true costs are not being included into products. It is even worse than other industries, such as electricity, mining, and oil and gas.

Buckley therefore believes that there needs to be more focus on sustainable and resilient agricultural industry. He noted that resources are being stretched and continuously used beyond the limits. The situation is made worse by climate change, creating security and food issues around the world.

Buckley made the point that, despite increased mechanization, robotics, and some software advancements, the agricultural industry has not changed greatly. It has gotten bigger, has wasted more resources, and has become less efficient. The industry has created more health problems because of the way food is produced, and yet there is also starvation, malnutrition, and hunger.

His company ANJA stands for “Adaptive Nutrition Joint Achievements.” They are partners with TESLA, Siemens, DHL, William McDonough, Delta Development, Ellen MacArthur Foundation, and many other companies that are all part of solving this big, global problem in their industry.

Looking at their industry, they found six global challenges: energy, food, disaster resilience, environment, water, and health. They looked at the six challenges as a dynamic model, and they then addressed all the facets at one time, in a complete system. They did this using the circular economy principle.

ANJA promotes awareness to encourage companies to switch to 100% cradle to cradle. He explained that there are two basic cycles: the biological (or organic) cycle and the technical cycle. In the biological cycle, the waste can be used and it can stay in one cycle. In the technical cycle, products can be recycled or reused.

Buckley noted that in the world today, there is no single agriculture or food and beverage production facility that is doing this 100%. A main reason given is cost, but he asserted that the cost is reasonable. Renewable energy is actually cheaper in many countries than coal and nuclear, and the long-term effects are better. He explained that they are using Tesla power packs, as well as Aquion saltwater batteries, which are cradle-to-cradle, and also wind energy.

He gave the example of Coca-Cola, which has 900 production facilities throughout the world. Sometimes, they are able to find resources from the government to make a facility more environmentally friendly, such as to use solar or better water management. The problem is that they do not apply those improvements to their other production facilities, so they are all efficient. That is really the shift needed throughout the industry.

Presenter #2: *Pacita Juan*

Juan started by talking about ECHOstore, which is one of the few shops that carry organic and eco-friendly goods. Founded in 2008, it is a social enterprise with a business model that is small and agile. The name is an acronym: “E” is for environment; “C” is for community; “H” is for hope, and “O” is for organization. They also called it ECHO, because they wanted the idea to echo, to reverberate.

Their bigger store is a café where they serve farm to table. They grow the vegetables so they know where the vegetables come from. It is about traceability, transparency, and also inclusive growth.

Related to food, **Juan** made two main points. The first is about the slow food movement, which is simply to eat good food. It is not necessarily about not eating meat, but eating less and eating good. The second is about eating clean, which means cutting out pesticides, which requires knowing where the food comes from. There is also the element of fair food to ensure that farmers are paid well. That is why ECHOstore sources from local farmers.

Juan challenged the audience to think about their daily lifestyles and their role as a consumer. That is one element – the self. The second element is involving community and family health. The third element is the planet. If everyone was more aware about the effects of their food consumption, the planet would benefit.

Presenter #3: *David Conn*

Conn first explained that he has been working in Papua New Guinea (PNG) for the past 40 years. PNG, the largest economy in the Pacific, is trying to develop their soft commodities in areas that are threatened by climate change. Over 87% of the population subsists on less than one dollar a day, and they are already environment-friendly. That’s how they live. He stressed that most people cannot underestimate the value of land to a Pacific Islander. When your land is your last remaining asset, you have to be green.

PNG’s unique resource endowment and location in the crossroads of the Pacific – Australasia, Indonesia and Asia – underpin a positive outlook for natural wealth growth. Green business must

play an important role in the country's agenda. Indeed, most businesses in PNG operate under a strict social license in PNG. The CSRs are expected, if not demanded. **Conn** also pointed out that PNG was one of the first to sign COP21, and at the moment, there is a huge debate on its first coal fire project, a 50-megawatt plant.

The Asian century will create long-term demand for growth for many soft commodities in PNG. The country wants a share of the $7 trillion global tourism market, as well as the $105 billion organic farming market. They are also attracted by the $17.1 billion investment in sustainable growth, although they do not yet see much traction from the multilaterals. The government has approached the multilateral donors with a case to be a part of the green agenda, as the average Pacific island is a green advocate.

Conn would like to think that he is optimistic about green growth and about the opportunities in PNG. Green business could enhance the value of assets. The government has already established targets of exports for palm oil, coffee, and cocoa of $3.5 billion by 2030. This is a five-fold increase from 2010, at export levels and long-term pricing.

However, the agribusiness sector is limited, as achieving greater scale in the country is a great challenge. There are several actions that need to be taken by the government, such as improved transport and infrastructure logistics to provide better market access, lower inbound-outboard costs and support quality while reducing time to export, setting quality and yield targets linked to market yields, and extension support and research and development. Other policy actions center on land issues. A lot of actions are also needed to support financing, especially fund investment and new processing capacity.

In meeting the huge financing gap, PNG understands the concepts of due diligence, but there is a lack of a proven track record among SMEs in PNG. Scalability is also a big issue in the Pacific, where many of the countries have small populations. These are important aspects that need to be addressed for PNG to get involved in the development of their soft commodities and agribusiness.

Conn also pointed out that the government has a heavy hand and that needs to be addressed. An enterprise called Kumul Consolidated Holdings controls all of PNG's state-owned enterprises and now wants to enter into tourism and agriculture.

Finally, he stated that another limiting factor is that PNG's agribusiness SMEs are not part of supply chains, which makes eco-labeling difficult, even if they could afford the technical expertise and labeling costs. And yet, these SMEs are more authentic and true to the vision and values of green business.

While **Conn** remains skeptical that PNG can overcome green business obstacles such as scalability, he can imagine that the country will improve its access to Asian markets for its soft commodities, mainly cocoa, oil, palm oil, coffee, timber, and tuna. Government policy will help drive this, and he supports the government's push to transfer nearly 80% of logging to sustainable forestry.

Presenter #4: *Dewi Bramono*

Bramano first offered a quick background of her company, which is a pulp and paper business based in Indonesia. They have operations both in Indonesia and PRC. Their products cover printing paper, tissue, packaging, and more, and sell their products in over 120 countries

worldwide.

The company sources their pulp wood from Indonesia, from 38 industrial plantations and forest concession holders located in five provinces within the Sumatra and Kalimantan Islands. Together, their pulp wood suppliers manage about 2.6 million hectares of land.

Bramano explained that the forestry-based industry is a long-term business. It takes at least five years for trees to be harvested for production. Thus, their profitability depends on their capacity to manage these natural resources sustainably, in order to ensure that the forest environment will still allow them to produce pulp and paper in the future. That means they need to address all aspects of sustainability.

That is why in 2012, after extensively researching industry best practices and engaging a lot of their stakeholders, they launched their sustainability roadmap called Vision 2020. It was developed to guide them over the next ten years in achieving their vision to become a respected industry leader in operating in a sustainable and responsible way.

The roadmap includes 11 impact areas, which can be categorized into four aspects: the production environmental impact; forestry; supply chain; and social. To further strengthen their commitment to have zero deforestation across their supply chain, they launched their forest conservation policy (FCP) in 2013. It accelerated their commitment to ending natural forest conversion from 2013 to 2015.

In addition to the zero-deforestation commitment, there are three other pillars within the FCP. These are: 1) reducing greenhouse gas emissions through best practice management of peatland in their forest concessions; 2) improving the engagement of their supply chain with the community to ensure that legal and traditional rights are respected; and 3) ensuring that the wood fire that they procure for the global markets are sourced from areas that are managed sustainably and responsibly.

Bramano explained that these moves made sense from both a business and environmental perspective. Early on, they realized that natural forest conservation is a big, complex, and costly undertaking. It needed to be approached from a landscape level, including connecting swathes of forests and peatland that cross over man-made or administrative boundaries, such as forest concession boundaries or provincial boundaries. This requires close alignment of objectives, and coordination of activities with multiple stakeholders within the landscape, which include related government agencies at district and provincial levels, other industries, industrial concession holders, conservation NGOs, academics, and last but not least, the community that lives in and around the forest area.

Communities are key in forest conservation. Depending on how they engage them, the communities can either help them in protecting the remaining intact natural forest, or can be a threat, due to illegal logging, natural forest encroachment, and accidental forest fires due to traditional practice of slash and burn. The actions of the community are tied to their economic needs.

When people live around forests and they are not able to meet their daily needs, they are more likely to resort to deforestation in order to expand their agricultural production, either for generating income or for their own consumption. This is a direct threat to the business and conservation efforts. So if they want to thrive as a business, they need the communities to also thrive. To tackle the destruction of the forest, they need to tackle the root cause.

For that reason, they developed a program in 2015 to support sustainable livelihoods for communities in 500 villages through integrated forestry and farming. The program shifts their activities from more of a charity model to economic empowerment. It includes providing community members with equipment and support in the form of microfinance, or revolving funds to kick-start local businesses. The core concept is to support the community to find alternative livelihoods that protect rather than destroy the forest, and bring these communities to the company's value chain. They have committed up to $10 million for the next 5 years for this program.

The Integrated Forestry and Farming System (IFFS) program developed productive activities at the village level, thus lessening the pressure on forest land, and encouraging communities' participation in safeguarding forests from destructive actions. The process started with social mapping studies that identified 799 villages or hamlets located in and adjacent to their concession boundaries. And for the first 5 years, they have committed to involve 500 villages or hamlets.

There is now a need to identify which villages out of the 799 will be included and which ones should be prioritized throughout the 5 years of the program. The chosen communities will be assessed based on the following criteria: risk for fire; risk for encroachment; risk for illegal logging; and risk for social conflict. Once the villages are prioritized and selected, the community engagement team of the related forest management unit starts to develop suitable agroforestry programs. To ensure that communities take ownership, they make sure that the approach is participatory.

To help institutionalize the program, they also enter into agreements with village institutions whether it's a village-owned cooperative or village-owned business. Support is then provided in the form of a rolling fund or credit that the village institution itself has to manage. The fund itself is in the form of a grant from their company to the village institution. They also provide mentoring and assistance to the community for the first year of implementation by recruiting what they call village facilitators.

Bramano provided an example of a village in Sumatra. There are 135 farming households in the village, and the IFFS programs focus on horticulture, farming, and vocational skills (to support the transportation of their products). Currently, the community income is about $153 per month, covering about 70% of the households. Programs also focus on planting fruits and vegetables, aquaculture, fisheries, and animal husbandry. These programs help villagers earn more money and increase productivity, while also reducing the need for them to encroach on the forest land.

To close, **Bramano** noted that this is just the first step and much more needs to be done to address deforestation on a larger scale. The process is still evolving, and they do not have the resources to do everything. He reiterated that many of the villages are actually outside the concession boundaries. To expand the program, they are trying to work with other companies and also government authorities.

Question #1: *Katagami asked the panelists about the prospect of making money by going green.*

Buckley responded that there are opportunities to make money, but that it is not about the money. It is instead about the future, about sustainable resilience. There is a need to shift the way of thinking and not be so concerned by short-term profits, and focus more on becoming resilient to climate change over the longer-term.

Juan stated that she considers the challenges they faced in making growth inclusive in sustainable farming and social enterprises, and notes that they are now being copied. There is a lot of interest in organic farming and eating natural, as there is double digit growth in the organic sector worldwide. To expand the market for organics, she questions farmers about how they can decrease the cost of organic food and promote it to the villages.

Question #2: *Katagami then asked the panelists to comment on different measures that can be taken to promote green business. These include a tax on GHG emissions or valuing natural capital.*

Conn shared his experience of moving to his wife's village in PNG. He faced a choice – put in solar systems for $40,000 or buy a petrol generator for $2,800. He noted that people in Pacific economies are living for today, so the agenda gets a little more immediate. That's where people say, "Show me the money."

Buckley shared a saying that the greatest cause of human misery is that we think about now instead of the future. That is always the dilemma, especially with the poor. That is why he believes that we need to think in systems. We need to think about all the facets—culture, region, location, resources, water—every facet and aspect and think of it all together.

Question #3. *An audience member asked about the replicability of the models in other parts of the world, such as in the Philippines.*

Buckley noted that it's not a cookie cutter system. While the technology and the model are transferable worldwide, the system needs to fit into the Philippines or PRC or Argentina. There are different environmental and cultural conditions that need to be considered.

In Germany, they used not only rainwater harvesting, but ambient water harvesting. In the Philippines, they would probably do the same because there is a lot of moisture in the air. In terms of things that they might do differently in Asia, **Buckley** mentioned that they use vertical farming in Germany, but aquaponics is more fitting in Asia. This could be done in a vertical-type farming system.

One important consideration is resilience. **Buckley** gave the example of a smaller specs version of their vertical farms called container farms. These are 40-foot refrigerated containers they are working on with FAO and the World Food Programme. They have different refugee camps in Lebanon, Beirut, Jordan, Algeria and a couple of other places, where they place the container farms. It's a system that can be applied and fit into the specific locations, but still profitable and doable in each of those areas.

Question #4. *Another audience member asked if there was a way to go beyond carbon neutral, wherein you can be a participant in actively removing carbon out of the atmosphere, generating more energy for operations, and also increasing crop yields and sustaining communities.*

Bramono believes that is what they are basically trying to do with their IFFS program. They will continue to profit in the future, because they will maintain the ecosystem and make sure that the people around the area also have a good livelihood.

Juan stressed that you have to start small, as people are overwhelmed with the cost. From there, it's important to replicate. It's the mindset. There has to be a decision point where people want to move forward and do something.

Katagami commented that ADB is investing in this long-term transition. They started looking at the things that work together with private companies, and then choosing which areas ADB could really make a difference. She gave the example of food waste, which is a tremendous opportunity. ADB made a conscious switch from intervening only at the farm levels, and from only working with the government, to thinking more about the business model in developing agribusiness.

Track 3B – Greening Industry: Improving Resource Use, Reducing Waste

9:15-10:45 a.m.
Auditorium C

Chair
Matthias Gelber, Co-founder, Maleki GmbH

Panelists
Tatiana Gallego-Lizon, Director, Urban and Water Division, Southeast Asia Department, ADB
Puan Sri Maimon Arif Patail, Director, Malaysian Mosaic Sdn. Bhd.
Pavel Cech, Managing Director, ResourceCo Asia
Tamal Sarkar, Director, Foundation for MSME Clusters – India
Anthony Halog, Faculty Member, Industrial Environmental Management, University of Queensland

Presenter #1: *Pavel Cech*

Cech represents an Australian resource recovery company founded more than 20 years ago that concentrates on mineral and combustible materials derived from waste and used as fuel or raw materials. The company produces artificial aggregates used for structures and concrete, as well as alternative fuels from non-recyclable, combustible waste, such as used tires. His presentation covered an overview of waste management in Asia, including trends, common misinterpretations, game changers, and recommendations for improvement.

Asia has had a variety of experiences with waste management. Developed countries have attractive disposal fees, but very often do not have the real, appropriate recycling infrastructure or political willingness, and as a result, waste is commingled. High land values also mean fewer landfills, and incineration is often a common solution for waste disposal. On the other hand, developing countries have higher tolerance for dumping, legally or illegally, with little waste management practices in place and relatively weak enforcement of laws and regulations.

Cech noted that the life cycle model, while not new, is not always practiced. He presented a list of ideas for the game changers using the "sandwich" analogy. Resource recovery is sandwiched between two customers: one is the generator of the waste or the polluter, who has the responsibility of waste disposal, and the other is for the recovered product. Value can be extracted from each side of the sandwich.

- From the side of the polluter, there needs to be segregation of waste at source, because commingled waste costs money and creates loss throughout the value chain. Segregated waste can save $10-$40 per ton of waste. Regulators should have systemic solutions.
- There is no transboundary market for recovered products, which could potentially create a few billion dollars per year, if implemented correctly and if countries can harmonize their legislative frameworks.
- Financing is needed for effective solutions within realistic value chains.

- Green design is important. If the product has not been designed with the environment in mind, problems will arise in the future. Even in recovery and recycling, there must be proper design of any product, using proven concepts (without waiting for future technology).

Furthermore, **Cech** warned that one common misinterpretation is that waste management can be low-cost. He argued that proper waste management costs money; without investment, solutions can be harmful or cause more pollution. Polluters need to pay for this, not governments.

There are successful business cases in the region.

- TyreCycle (Australia) has exported over 80,000 tons of tire-derived fuel and continues to grow.
- EcoEdge (Philippines) has produced 40,000 of refuse-derived fuel out of municipal and industrial waste.
- Lahore Compost (Pakistan) initially lost money after the price of carbon credits used to fund the company dropped sharply, before refuse-derived fuel provided a revenue stream through the compost manufacturing process.

This is a massive dormant market, which **Cech** encouraged everyone to tap into as it can create great opportunities for businesses. Governments need to be involved to unload the market and to harmonize regulations. While technologies are available, tried and tested approaches for waste management can already be implemented, and these must be studied well. The costs for proper waste management solutions must come from polluters, as every green business costs money. Segregation at source is the most important part because it saves a lot of money. **Cech** concluded his presentation by saying there is opportunity for everyone as long as all actors have shared goals.

Presenter #2: *Puan Sri Maimon Arif Patail*

Patail explained that her company is in the ceramic tiles industry, which is water and energy intensive. There was hardly any water for industrial use in Kluang Jalor, where their plant was built 50 years ago. They turned to water harvesting as a solution. That was the start of the company's journey into waste minimization.

Patail highlighted that these innovations were introduced within the company by empowering and investing in its people. Providing a conducive ecosystem for failure is also necessary for innovation. The technology may be out there, but if employees do not appreciate and understand it, they will continue wasting.

One measure was to create incentives for becoming more resource-efficient. At the beginning of the year, their staff make a commitment to management on the kind of cost-saving initiatives to be made by the end of the year. From there, the management will negotiate how much will be returned to the employees. In this way, employees can see the impact of waste to the company's bottom-line and how that translates to their own pockets. Two years after beginning implementation of these initiatives, the company saw 20 million ringgit ($5 million) in savings.

Presenter #3: *Tamal Sarkar*

Sarkar, who represents a non-governmental organization supporting the development of MSMEs, shared that he believes that small companies are looking for immediate gains. As such, they approach SMEs with two focus areas in mind: occupation, health and safety; and greening. The Foundation worked with around 600 SMEs on the latter and saved close to €2.5 million in two years' time.

One problem encountered by the Foundation was how to reach out to SMEs. In India and Southeast Asia, there is an estimated 70 to 80 million MSMEs, 95% to 99% of which are micro-enterprises. In India, around 90% of MSMEs are unregistered. The method of engagement Sarkar's group adopted was the cluster approach, which involves working with local small industry associations.

One example involves foundries, of which there are around 5,000 to 6,000 in India, concentrated in three areas. In one of these areas, in northern India, Sarkar's organization demonstrated to MSMEs that foundry technology works. Once there have been successful cases, industry associations are involved and become torchbearers for the concept. Once associations are on board, the Foundation works with the MSMES to promote occupational health and safety to ensure that the workforce, while mostly casual laborers, is semi-permanent. In this case, one major gap lies in the appropriate availability of service providers.

Gelber supported Sarkar's points by sharing a similar case study in the Philippines, where a large company wanted to engage the supply chain to improve resource efficiency, while SMEs were concerned that they would not meet compliance standards. This was addressed by reassuring the SMEs that reducing waste will bring cost-savings. He suggested that one key output for engaging SMES into greening industry can be to lock rapid delivery of ROI into the business strategy; otherwise the engagement will not be long-term or sustainable.

Presenter #4: *Anthony Halog*

Halog stressed the importance of creating sustainable value chains and networks. The next generation of business leaders, policymakers, scientists, and engineers must be trained to become collaborative, more system-oriented thinkers, and better able to understand the interconnectedness of different issues with respect to the SDGs, as humans and natural systems are inextricable.

There is a big push for countries in Asia and the Pacific to move towards circularity. For example, though PRC's use of resources has been unsustainable, causing air, water, and land pollution, the country has shifted towards circularity by ratifying its Circular Economy Promotion Law. More countries should be empowered to work in conjunction with the targets set in the SDGs and the Paris climate agreement. Other frameworks and concepts that promote a systems-thinking approach, such as cradle-to-cradle, environmental life cycle assessment, and green design, can also be followed.

The circular economy concept demonstrates the need for interconnectedness and has already been applied to a wide range of industries, including food, biofuels, and telecommunications. **Halog** asserts that benefits can be doubled if the concepts are applied in conjunction with the SDGs, with a significant reduction in greenhouse gas emissions while allowing for increased resource consumption. For example, in Australia, there is a focus on scaling up biochemical materials production, with 10-year bio future plans being planned for mainstreaming. For technical materials, there should be a focus on repair and maintenance.

Halog re-emphasized the need for systemic solutions and pursuing extensive collaboration with different stakeholders, including government, private sector, youth, civil society organizations, and households.

Presenter #5: *Tatiana Gallego-Lizon*

Gallego-Lizon's work focuses mostly on municipal services, where much waste is generated. As an overview, she shared that more than a billion people have been added to cities between 1980 and 2010, and another 1.1 billion people are expected to join by 2040, adding up to more than 60% of the world's population moving to cities by 2040. There are many challenges that come with such a dense urbanization pack-up of population. First, there is a rising demand for resources. Second, there are growing consumption patterns that come with better lives and more demanding lifestyles, and an increasing depletion of natural resources. Lastly, there is serious climate disruption, increasing temperatures, and extreme weather events.

Economic growth is driven by cities, where 70% to 80% of the GDP of most countries is generated. However, livability is compromised in many cases. Cities occupy only 2% of the land around the world, but they consume 75% of all resources and generate similar amounts of waste. 80% of the 20 most polluted cities in the world are also in Asia. Additionally, cities account for more than 75% of all carbon dioxide being generated, which compromise significantly the share of global greenhouse emissions made.

Gallego-Lizon said that there is a need to systematically move towards considering recovery of water, energy, and land resources in any possible event. Opportunities for green infrastructure are also multifold, from construction to municipal services. For city design and municipal services, there are opportunities in compact development. There is a need for climate-sensitive planning strategies, including smart densification and living street landscapes, as well as a more efficiently managed water cycle to ensure that climate proofing is incorporated and that risk-prevention and management is part of any city strategy.

For green and sustainable buildings, a significant fraction of greenhouse emissions is generated by buildings in cities. A smart building is energy-efficient and contributes positively to the environment and to the community in that city. Building certification can be promoted and incentivized in many countries. Developing low-carbon policies is driven by cities and may incorporate public transport and waste recovery, among others. Sustainability strategies addressing conditions in informal settlements (which make up at least 30% of many cities' populations) are also needed. Smarter, cleaner, and more efficient energy systems, which can look at decentralized energy networks, smart metering, and real-time pricing, are also needed.

Gallego-Lizon provided a list of examples of infrastructure projects demonstrating the move towards the circular economy and getting additional value from generated waste.

- Kolkata, India reduced its amount of waste by minimizing water leakage and loss. The city was awarded and is implementing the first phase of a performance-based management contract looking at non-revenue water (NRW) reduction from up to 70% down to 20%. This will be implemented gradually throughout the city.
- Mangaluru, India received ADB assistance to construct four sewage treatment plants, as well as tri-main sewers and the collection system, in 2009. With the sewage treatment plants fully operational, the city considered what could be used for the discharge effluent, which would not be utilized, and when the Mangalore Special Economic Zone was short of water. As a result, the Mangalore City Corporation and the Mangalore Special Economic Zone signed a memorandum of agreement. Thereafter, the

construction of a power plant of about 30 kilometers, a tertiary treatment plant of about 22 megaliters per day, and the distribution network within the Special Economic Zone were constructed and now are fully operational and maintained.

- Mandalay, Myanmar, is in the process of constructing its first wastewater treatment plant. It has a process of recovering energy, so it has a biogas system that will be used to co-generate electricity to run the plant. The city also put in place a system for collecting sludge, which has been stabilized and will be disposed and used for the cement industry and manure for farmers.
- Jaipur, India has a 62.5 megaliters per day sewage treatment plant, which was completed in 2006. Post-completion, it was decided that a system of electricity co-generation would turn the digested sludge into energy to power the treatment plant itself.
- In the PRC, there is a solid waste management site given to a firm, Everbright. It has a landfill site, which was constructed with an already intended collection of methane for introducing into the gas system. It also has a waste-to-energy plant, which uses the innards and non-recyclable and non-compostable elements to be burned and generate electricity, which is thereafter put in the grid.

Discussion

Patail asserted that the green economy is not necessarily a new industry; rather, it is about changing the mindset of looking at one's business. For her, the nature of business has gone from focusing on profit first and social responsibility later to becoming primarily about doing good while also doing financially well in the process. In addition, competition and price erosion challenge businesses to be green. What does not create value to the customer is waste. The challenge then is translating the message that "waste is cost is profit" to something that the people working on the ground can understand and can live by. Patail's company also explores ways to reduce waste by looking at three areas - the hardware or the technology, the software or the people, and processing and production. More often than not, it is the people that can really create value. Finally, recycling waste also isn't always possible, when the policy environment doesn't allow for it. It is therefore essential to engage and change the mindsets of decision-makers in order to revise the regulatory framework.

Question #1. *An audience member asked about the waste-to-energy model, particularly the breakdown of the waste stream, including elements that are most or least productive, and how that affects the model's viability.*

Cech cited Metro Manila, Philippines, where about 8,000 tons of waste goes to the landfill every day. The average moisture content is between 60-70%, depending on the weather. The energetic value of the municipal waste collected is very low, barely enough to evaporate the water in the waste. Additional fuel is needed to ensure consistent combustion of the waste material. Other options include improving collection fees, which the government is unable to subsidize, or adding a fee and tariff to cover the high operating costs. With a proper system of waste segregation in place, more recycling can be done, better biomass can be extracted, and alternative fuels can be made from non-recyclable materials, for example. Ultimately, the system will depend on the actual mix of waste materials, and a one-size-fits-all solution is already compromised.

Halog shared that, following circular economy principles, it is preferable to convert the waste into biochemical biopolymers, because they are highly value-adding products. If that cannot happen, they can be converted to the next valuable product, which may be in the form of biogas or as an environmental additive to grow plants. In accordance with circular economy principles,

the production of bioplastics is tighter, which means the value is higher compared to producing it for energy-generation. Based on his experience in the US, it is also better to convert waste first to biopolymers rather biofuel.

Gelber added that in different parts of Europe, there are waste-to-energy plants that were heavily subsidized because they were designed at a time when there was a much higher volume of waste being generated. As a result, they have become financial liabilities rather than useful tools for tackling waste.

Question #2. *An audience member, who represents an organization heavily engaged in implementing proper recycling solutions, shared that he thinks there is a problem with priority-setting, particularly in developing countries. Communities are encouraged to build landfills and, in turn, big waste-to-energy plants. He asked whether this is the right strategy and what kinds of plants should actually be developed. He followed up with a suggestion to build professionally designed and operated recycling plants first and then incorporate other priority approaches.*

For **Sarkar**, "waste" is nonexistent. Waste can be defined as something that has to be reused after a gap. However, it must be handled scientifically. Waste does not always need to lead to energy, but it can lead to many other innovative activities and technologies, including making water and paper blocks. Knowing the sources of the waste is important for coming to these solutions.

Cech argued that waste is waste if something is being wasted and until it becomes something else. Reframing waste as "wealth" will not lead to anything as people may believe that they are not wasting anything. People need to talk about it and not shy away from calling it waste, in order to tackle the waste problem and make it into something better.

Question #3. *A representative from the Archdiocese of Manila asked if the panelists knew of successful green educational institutions that are practicing circular economy principles by greening their system and can assure a return on investment at the soonest possible time.*

Halog answered that many institutions in the Netherlands, such as Leiden University, are advancing the idea of circular economy, and many students are getting involved. There are a number of research institutions focusing on the circular economy in France, as well as PRC, where a law has been passed to challenge the different sectors to incorporate circular economy principles. He suggested Tsinghua University, which is a leading research group in circular economy. In Australia, Halog's own institution, the University of Queensland, hosts the Global Change Institute, which funded a project to adopt circular economy principles in the agri-food sector, including the red meat industry. Other institutions such as the University of Sydney and the University of Melbourne, are also working on the circular economy. In the Philippines, Halog is working with the local community in Butuan City to apply circular economy concepts in getting value out of tailings from the mining sector.

Question #4. *An audience member asked what is necessary and what are the assumptions required to be adopted in order for the cases and proposals discussed by the panelists to be replicated in Asia.*

Gallego-Lizon outlined three essential areas. First, there needs to be policy enforcement and implementation, which require substantial political commitment. Second, there needs to be financing and development of infrastructure. Third, there needs to be awareness and citizen participation in developing solutions, or else they will not work.

Sarkar noted a lack of improvement in terms of policy implementation and regulation across Asia. However, the price of enforcing laws and the information gap can be reduced by bringing better practices and complying with existing green laws.

Cech also noted that Asia is not a homogenous entity and practices will vary across countries and regions. In developing countries in particular, vested interests of different groups, lobbyists, and individuals are the biggest hindrance, including regulations, applied technologies, and applied methods, among others.

Question #5. *An audience member from Junior Chamber International shared that while greening business has already been in practice for many years, changing mindsets and raising awareness are still needed. She asked where the problem lies and how a breakthrough can be achieved in terms of greening industry, waste minimization, and more efficient resource use.*

Gallego-Lizon pointed to two areas where people can put in their efforts. First, consumption patterns need to be managed better. While marketing and advertising are contributing factors, there are also policies that engage and promote consumption, which need to be managed to reduce pollution. Second, production processes, including how resources and waste are managed, can also be considered. Technology must be considered as part of the solution.

Halog answered that the solution for going on the right path to sustainable development is to use a systems approach, which is collaborative, respectful, and understands the interconnectedness of the different issues, rather than a silo approach.

Sarkar stated that in order to address the big waste problems, the smaller waste problems need to be addressed first. People need to look at two areas: working with, identifying, and creating the industry associations and service providers; and working with the SMEs through the services.

Patail shared that, as a private company, they owe it to their shareholders to get a return on their investments. She gave two tips for managing waste: first, waste not, want not; and second, plan well and execute once.

Cech suggested that people start small by internalizing the waste problem at the individual level before buying or selling. At the same time, people must also understand that waste is a global problem, as a result of human overpopulation and valuing endless growth. Economic models and individual consumption patterns must all change.

Gelber closed by sharing that his contribution to addressing resource efficiency is to build a carbon-neutral tiny home with zero externally-sourced electricity and water and generating zero waste.

Track 3C – Greening the Service Sectors

11:00-12:30 p.m.
Auditorium A-B

Chair
Victor Lee You, Principal Knowledge Sharing and Services Specialist, ADB

Panelists
Dilshan David, Executive (Sustainability & Environmental Management), Heritance Kandalama – Sri Lanka
Matthew Rajendra, Founder and CEO, Green Data Center LLP
Lote Lima, ICT Training Coordinator, Samoa Chamber of Commerce and Industry
Roderick Ruhl, Chief Technology Officer, Geo Data Intelligence Ltd.

Presenter #1: *Dilshan David*

According to **David**, green business is important for the hospitality industry in Sri Lanka because of the country's rich biodiversity, the wise use of available natural resources, and the high regard for the well-being and diversity of its local communities. Because Sri Lanka has many world heritage sites, hospitality is becoming a core business in its economy.

Heritance Resort Kandalama, founded in 1994, is located in Sri Lanka's central region. Once a controversial hotel project, it became a green business through public pressure and a change in management mindset. The Kandalama tanks situated in front of the hotel were built by ancient kings and are still being used for irrigation. The local community believed hotel activities would pollute the tanks and affect the well-being of the community. A policy decision was taken to not obtain a drop of water from the tanks and not to release a drop of water back to the tanks after being used in the hotel.

The hotel went through the Environmental Impact Assessment process but was not built to comply with any green building criteria. It currently uses several tools to address green business concepts in its operations, including ISO 14000 (environmental management), 1SO 15001 (energy resource management), HACCP and ISO 22000 (food safety), OHSAS 18001 (occupational health and safety), corporate social responsibility-related activities, training and development, and other certifications such as Green Lobe, Earth Check, Travel Life, and Switch Asia. In 2000, the hotel building was certified for US LEED Bronze Standard. It is the first hotel in South Asia to win the Green Globe Standard, and the first hotel to have ISO 14001 certification from 1996.

The resort is built across eight acres, out of a total of 243 acres to prevent competition in the vicinity. The entire hotel is built on columns and with no excavation. Since no alteration was done to the land, the natural flow of storm water is visible. Open spaces throughout the resort provide natural lighting and ventilation. There are seven floors spread over 500 meters across the jungle.

In terms of current resource management practices, **David** shared two examples:

- To manage energy, in 2000, a gasifier was installed to run the boiler, reducing 50% of boiler diesel consumption. The initial investment of 14 million rupees was recovered after

two and a half years, making a gross profit of 35 million rupees and saving 1,600 tons of carbon dioxide. Furthermore, a study was conducted to improve the efficiency of internal lighting, upgrading the lighting fixtures and managing their use based on a lighting timetable, and it was found that the savings potential per month is 111,000 rupees, amounting to an annual savings of 1.3 million rupees.

- To manage water, it was observed that (as of end of 2015) 24% of total water consumption was used for staff accommodations, travel assistance accommodations, and vehicle washing. A water flow rates study was conducted, based on international best practice, where sink taps, shower taps, shower heads, and common system tanks capacity were measured separately. In reviewing the travel assistance accommodation and one washroom from the staff accommodation, 69% of the water fixtures were found to be inefficient. By converting the water fixtures standing at baseline level, one step up, a net saving of 5,500 liters per minute was calculated. By this way, even a green business can be converted to a greener business venture, assuring continual improvement and sustainability of green business approaches.

Efforts to further green operations are already being explored. A biodiversity assessment is proposed to identify the unique properties related to fauna and flora of the surrounding forestland, as well as a plan to declare it as a privately-owned conservation forest in the future. There are additional opportunities to include carbon offsetting and carbon banking or trading.

Presenter #2: *Matthew Rajendra*

Rajendra stated that the ICT industry is growing at a phenomenal rate. The digital world will grow 44 times by 2020, with 50 billion mobile connections and $4 trillion in annual spending. In 2016, the world spent $3.5 trillion in the ICT industry, including telecommunications, IT services, software, devices, and data centers. Zeroing in on the data center market, $185 billion will be spent in 2051, and it's forecasted to grow to $284 billion in 2020.

With growth comes challenges. The data center market alone is responsible for 3.3% of the world's greenhouse gas emissions. Rajendra explained that if the data center industry were a country, it would be one of the top 5 countries with the highest carbon footprint, which is growing at a rate of around 6% annually.

While the ICT industry can reduce its own emissions through an effective energy efficiency strategy, there are tremendous opportunities for IT solutions that reduce the 90% of emissions coming from the rest of the economy. According to Rajendra, these include efforts to "green by ICT" (using ICT to green other sectors of the economy) and "green ICT" (focusing on energy efficiencies and e-waste in the IT industry itself).

Countries are striving to become digital economies, where citizens enjoy mobility through smart devices, ubiquity through social networks, flexibility through cloud computing, and ambient technologies through the Internet of Things. These can boost productivity, bridge distances, and improve service delivery. A low-carbon digital economy can be achieved by incorporating energy efficiency by design, using clean energy, generating minimal waste, locally sourcing materials, being socially responsible, and complying to environmental regulations. These efforts will lead to lasting energy security, cost-savings, job creation, gross national income increase, and general improvement in quality of life.

Rajendra identified five main issues that need to be addressed in order to transition to a green ICT industry, some of which are initiated within the industry, while others are part of the macro-environments that are not in control of the ICT industry itself.

1. First, the ICT energy cost accountability must shift from the domain of the property manager to the Chief Information Officer. The people in charge of the company's ICT facilities must be held responsible for the ICT energy bill and carbon footprint.
2. Second, company executives must recognize the leadership roles that they personally need to play to embed sustainability deep and wide in the organizations. According to Rajendra, in many companies, middle management often wants to increase ICT sustainability efforts, but these get depleted without buy-in from top management. The C-suite needs to embed sustainability from the top and let it flow downward throughout the organization.
3. Third, there needs to be a price on carbon to curb emissions. While politicians have not shown the political will to introduce carbon taxes, Rajendra believes this is something everyone should be advocating.
4. Fourth, on the consumer front, there must be a brand loyalty shift from services and devices that are not deemed to be environmentally-friendly towards greener options.
5. Lastly, there must be a regulatory requirement for sustainability reporting. ICT managers need to specify the carbon footprints of the ICT department within the organization itself.

Rajendra provided a few examples of how ICT can green other sectors. These top 10 technologies can contribute about 15.5% reduction in energy consumption and carbon footprint worldwide.

- Smart-built environments, including smart buildings, smart homes, and smart electricity grids: 10% reduction
- The Internet of Things: 2.1% reduction
- Carbon accounting: 0.3% reduction
- Resource intelligence: 0.4% reduction
- Sustainable business process management: 0.3% reduction
- A green supply chain: 0.6% reduction
- Green manufacturing: 1.3% reduction
- Telecommuting (working virtually from home) can lead to emissions reductions, with an estimated movement reduction of 0.5% of vehicles worldwide.
- An intelligent transport system accounts to about 5% of vehicles.

Presenter #3: *Lote Lima*

Lima represents the Samoa Chamber of Commerce, which is an incorporated society of over 360 member businesses that does advocacy, capacity-building, and awareness-raising work.

The Green Works Initiative, implemented in close collaboration with the International Labor Organization and the Ministry of Natural Resources and Environment, aims to develop core skills and competencies for green jobs in Samoa. The program aims to integrate environmental awareness and training for green jobs into Samoa's education system. The youth employment program also implemented a green work initiative to demonstrate the value of green work and green jobs for the youth. One of the initiative's first activities was the installation of tsunami warning signs in Samoa's main island, which contracted 15 at-risk youth. Another activity was the post-cycle cleanup at the riverbanks, which also engaged youth in climate change adaptation and environment upgrading. However, because it is a new initiative, activities are

currently more reactive than proactive. So, the mindset needs to be changed, with green businesses and green jobs as good initiatives to be more proactive.

Lima shared that, upon her return to Samoa, the business community will be encouraged to adopt and promote the benefits of green jobs, incorporate it into their work, and create job and entrepreneurship opportunities for youth.

Presenter #4: *Roderick Ruhl*

Ruhl's mission is to promote the use of drones to NGOs, cities, councils, and other bodies, and this includes showing how drones can be used to make operations greener. Drones provide a cost-effective way to monitor vast areas of land very simply. In 20 minutes, a commercially-available drone can cover about one square kilometer of land at a resolution of 1,000 times higher than on Google Maps. Information can then be shared online and across multiple users. Drones can also be used to track changes over time. In a project, drones need to be used in the earlier stages, but the data can be useful for analysis and forecasting. Drones allow big data collection, which can be used for decision-making in project management. Drones can also make it easier to adapt to changing situations on the ground. Ruhl asserted that any organization or agency running large projects have no excuse not to use drones in its daily operations.

While drones collect data from the air, that data still needs to be ground-proofed by computer applications and human knowledge and interpretation, so that results can be analyzed and calibrated. For example, if a drone captures irregularities with an area in terms of vegetation, data, such as plant and soil samples, need to be captured on the ground to understand why. In another example in Peru, drones were used to map out a long street and to automatically identify erosion, potholes, and cracks, but engineers were still needed to go along the road to validate the presence of the potholes.

Ruhl provided a few examples of uses and industries where drones can be applied:

- Heat loss inspections can be performed by drones on a large scale, where a whole block can be scanned. Conventionally, an engineer will hold up a heat-sensing camera at a building and try to identify spots where heat or cold is escaping. Drones can do this on a larger scale and can help observe heat loss patterns in a block or city over time. With forty percent of carbon dioxide lost or coming from building insulation problems, there is potential for greening operations.
- Drones can perform landscape mapping, using special sensors to identify vegetation, stone, or other non-living material. For example, when doing biomass estimation in a particular landscape, a drone can scan an area and automatically generate biomass coverage.
- Drones can also support municipal natural resource management. In Malaysia, drones are used to identify bodies of standing water, in order to reduce dengue. The data can help ensure that there is no water retention in public infrastructure, including roads and parks.
- Drones can also have post-disaster applications. Aircraft and a set of drones can map out landscapes and identify affected areas that need help, such as those with destroyed infrastructure. This information can then be given to the government, which can respond accordingly.

Ruhl shared that one of his visions for the future is for an open-source common platform that integrates drone-collected information by government agencies and NGOs and can be shared with and updated by the public.

Discussion

The panelists shared their recommendations, approaches, or stories for Forum participants to bring back to their countries or companies and move the greening agenda forward.

David shared two areas in need of attention. In the Asian context, there are two bottlenecks: lack of management commitment from organizations or political will; and changing mindsets. Many Asian economies have traditionally been dependent on agriculture, and with the shift towards service sector-related ventures, especially construction and tourism, changing stakeholders' mindsets has been challenging. With a diverse set of customers, some groups are more conscious about resource consumption than others. In response, companies are leading activities to build awareness and capacity. For example, regional hotel associations are working on building management, staff, customer, and media capacity in order to remove the bottlenecks.

For **Rajendra**, it is important to first have buy-in from top management, and then it flows downward. Then it becomes a choice between the carrot and the stick when trying to instill sustainability culture within an organization. Rajendra shared that, in his company's experience, the carrot works better than the stick; that is, incentives work better than punishment. He shared a measure they had undertaken with a customer, a multinational company, where employees tended to leave their desktop computers running even while away, instead of hibernate or standby mode to save energy. Hence, the computers still consume a large amount of electricity. Rajendra's team wrote and installed software in the office's desktop computers that detects when they were idle and automatically went into hibernate or sleep mode. The software tracked the amount of energy collectively being saved in a month within the organization and by the individual employees. Moreover, the organization incentivizes employees with the highest savings on their carbon footprints.

Lima emphasized that green jobs development needs to be encouraged, and in doing so, leaders must be proactive rather than reactive. In Samoa, with increasing youth unemployment, the Chamber of Commerce raised awareness of opportunities to address this problem through green jobs and green businesses. A collaborative approach is also necessary, including identifying key stakeholders and working in partnership with them.

Ruhl answered that the top-down approach is important, as money is always an issue when talking to governments and companies. With access to more data and more information about operations, clients can see how much money can be saved. For example, many golf clubs have started using drones to estimate cost savings on fertilizers and pesticides. As a result, there are environmental benefits, including reduced resource consumption and chemical use. In California, a golf club can save up to over a million dollars per year on water bills. For example, the Donald Trump Golf Club in Los Angeles used drones specifically to save on water cost and ended up saving about $800,000 per year on their water bill. Ruhl agreed with Rajendra's point that incentives always work.

Question #1: *An audience member, Matthias Gelber, asked the panelists about green business trends in their respective countries, including whether there are any support systems*

in Samoa for new green SMEs in the service sector, and whether it is new or existing resorts that are going green in Sri Lanka.

David answered that in Sri Lanka, most resorts are already traditionally green. Currently, going green is widespread, encompassing both cities and villages and including all large-scale companies, including those developing accommodation properties. Certain criteria must be followed to gain star ratings for hotels and resorts, followed by a regular monitoring process, which can show whether green initiatives are being followed. In 2016, the country's Tourism Act was revised, which enabled the addition of green jobs, greening supply chains, waste management, food safety, and occupational health and safety, among others, to the star rating criteria. However, while Sri Lanka's Tourism Authority and Environmental Authority have been empowered to enforce environmental laws, readiness is still low. As a result, some areas in the country have experienced significant environmental degradation, such as in Ella where two mountains have disappeared. David added that all Asian countries have environmental values but continue to deviate from them, so the main challenge is implementing environmental laws.

Lima shared that, in Samoa, green jobs are in demand, especially in industries such as construction and manufacturing. Support systems are in place. The Chamber of Commerce has worked closely with the Youth Employment Program and the Samoa National Youth Council, and is collaborating with NGOs and other government agencies to ensure there are opportunities and support systems, such as training or funding avenues.

Question #2: *Another audience member, Anthony Halog, asked whether it is necessary to incorporate cultural, ethical, and religious dimensions in pursuing sustainability. From the global supply chain perspective, many developed countries focus on the service sector, while manufacturing sectors are based in developing countries, where resources are disproportionately exploited to benefit developed countries. In turn, developed countries would need to account for environmental degradation in developing countries.*

Ruhl agreed with the statements, while adding that industrial production is changing so much that it will go back to developing countries, while manufacturing will use robots and a reduced, independent workforce, reducing labor costs. As such, the world is seeing a large, rapid shift in production processes. As a result, in Asia, jobs in the PRC are being moved to developing countries like Cambodia.

David also agreed that developed countries have been absorbing resources from developing countries. However, the situation is beginning to change, where developed countries are now helping developing countries to correct and improve efficiencies, environmental productivity, and ecosystem services, among others. In the future, the ways in which these are being implemented should be examined in a meaningful way. For example, the UN-REDD program is in search of locations in which to plant trees, with funds from European countries. There is also potential in Asian countries to have more forests and expand forest cover. However, the question remains whether this will facilitate development or will lead back to the status quo. The sustainability of inputs and assistance must be ensured.

Audience member **Gelber** responded that perhaps NGOs and pressure groups are more effective in maintaining global standards for large multinationals that manufacture in developing countries, because government jurisdictions might not always apply transnationally. Many NGOs have been especially effective in flagging major corporations with negative environmental or labor standards in developing countries, particularly in manufacturing and supply chains of textiles and computers. Many large companies choose to move their operations overseas due

to labor costs, not because of environmental standards. If a company has the right corporate philosophy and ethos and the environment is part of the strategy, then standards should be the same, regardless of location.

Question #3: *Audience member, Eric Raymundo, asked Ruhl about whether drone technology is cheaper than traditional methods of doing digital engineering maps. Using satellite images for digital engineering maps requires converting raster data to vector data using expensive proprietary software and highly specialized hardware. Because drone technology is web-based, it could be possible to forego use of the software and save on costs.*

Ruhl agreed that GIS incurs high costs, because it requires specialized training and uses a specific platform, making it difficult to share data. As a result, he confirmed that the web-based drone system can lower costs, ensures that more people can work on the same system, and is simpler to use than a traditional GIS. In addition, the price of drones themselves has decreased by 14% between 2015 and 2016 and already includes the ability to control the drones with the software, making them a cost-effective solution. Apart from financial cost, collecting data using a mobile field app instead of paper saves on time and other resources otherwise used to encode and secure data. The map-making costs have also been reduced significantly, from at least $10,000 to a monthly subscription plan of several hundred dollars, with the ability to process an unlimited number of maps. Awareness of these benefits is not widely disseminated.

Question #4: *An audience member asked what are the best green jobs or businesses in the service sector where youth can work to earn a decent livelihood and contribute positively to the environment.*

Rajendra shared the concept of ecological entrepreneurs, or "eco-preneurs", who create business models that aim toward sustainability while also making money. There are many sectors that can be considered low-hanging fruit for aspiring youth eco-preneurs, such as energy efficiency, which can yield immediate results. Visualizing urgent environmental challenges such as carbon emissions causing climate change through the use of infographics and online platforms like Google Maps is also a major opportunity for youth.

Ruhl also suggested three possible opportunities for youth. First, youth can work for an industry or create a business that will provide data for efficiency increases. Second, youth can work on innovations that generate efficiencies in power consumption, such as a new engine or turbine or more efficient generators. Third, youth can help develop alternative energy sources that do not rely on fuels. By analyzing the business opportunities, youth can find a niche in one or a combination of the three.

Track 3D – Innovation and Green Business

11:00-12:30 p.m.
Auditorium C

Chair
Simon Baptist, Chief Economist and Managing Director, EIU

Panelists
Carlo Figa Talamanca, Manager, Sustainable Green Fuel Enterprise – Cambodia
Katerina Kimmorley, Co-founder, Pollinate Energy-India; Senior Associate for Business Development, Clean Energy Finance Corporation – Australia
David Sundahl, Senior Research Fellow, Clayton Christensen Institute for Disruptive Innovation
Phat Nguyen, Project Manager, Inclusive Business Accelerator, Viet Nam
Patrick Chan, Chief Executive Officer, GAC Ventures; Managing Director, VisionEdge Technologies

Presenter #1: *David Sundahl*

Sundahl explained a few trends regarding innovation and progress. First, over time, people utilize more features of existing technologies, such as the mobile phone. Second, innovation and technological progress can almost always outstrip people's ability to absorb improvements. Likewise, for many decades, many people believed that firms had a hard time adopting new technologies and would consequently struggle. He added that sometimes the pace of technological process is incremental and sometimes progress takes large leaps. These are generally true for sustaining innovations. As these trends occur, there emerges an opportunity for disruptive innovations.

In the book *In Search of Excellence* by Tom Peters and Robert H. Waterman, Jr., Digital Equipment Corporation (DEC), which made mini-computers, was cited as an excellent firm and exhibited tremendous growth. After 18 months, the company cratered because of the entry of the PC into the market. DEC sold one of its mini-computers for $300,000, while a PC was sold for $3,000 apiece, which made it challenging from a sales perspective. This case study illustrates that, rather than being unable to keep up, from a management perspective, innovation can appear to be bad for business.

Understanding disruptive innovation means taking opportunities that look unattractive to most firms. When confronted with innovation, firms must think about it differently and not in the same way as other innovations. Sundahl repeated a point made in a previous session: the surest way to kill innovation is to measure it the same way as existing businesses. Measuring and investing in disruptive innovation must be done differently.

Sundahl emphasized the importance of distinguishing between sustaining and disruptive innovations and seeing how these fit into companies' existing business models. He encouraged companies to not wait until an innovation is "good enough" but rather to match it with a market that needs it and make it profitable sooner rather than later. One lesson from the crash of the dot com era was that companies should be anxious for profitability and patient for growth, and not the other way around.

According to Sundahl, the resource allocation process is often the biggest challenge faced within companies. He recommended that thinking about new opportunities and innovations should be built into an organization's planning, as they will look and grow differently.

Presenter #2: *Carlo Figa Talamanca*

Talamanca's company produces green charcoal, made from recycled biomass waste. Green charcoal is considered a clean fuel, because it produces less smoke and less volatile matter than traditional charcoal. It can be used as clean cooking fuel and has fewer negative health impacts. Traditional charcoal is made with wood and contributes to deforestation. The city of Phnom Penh uses 200,000 tons of charcoal per year, and as a result, massive surrounding forest areas are cleared for charcoal production. Because green charcoal is made from re-cured biomass waste, no trees are cut, and the company has carbon credit certifications.

While charcoal itself is not innovative, green charcoal is considered to be innovative in the context of Cambodia's charcoal sector, and Talamanca's company invests in innovation into the production, marketing, and policy advocacy.

The cost of production is very low, as the raw materials are free. The production process takes place inside a factory, where coolants and hot air collectors are used. The heat is used to dry the char briquettes, using dryers developed in Cambodia. Under this system, drying takes 19 hours than the usual four to five days for open air drying, making the production process more efficient. As a result, the company won the Ashton Awards, an international award-giving body for environment and energy.

In terms of marketing and distribution, the environment is not mentioned; rather, the emphasis is on the quality of the product. Cambodian consumers, including households, street food vendors, and restaurants, don't know or care that it is environmentally friendly, as long as it is of good quality. On the other hand, the same product had been sold at a premium price ($9 for 3 kilograms, as opposed to $1 for the same amount) and was doing well in Singapore, because of its reputation as an environmentally friendly product. Advertising on distribution tuk-tuks have become popular. Social media has also been an effective channel for marketing; the company's Facebook page was launched in June 2016 and gained 10,000 likes by November 2016. The company has also tried sales in supermarkets, organic shops, and gas stations.

Sustainable Green Fuel Enterprise also engaged in policy advocacy with the Cambodia government. The informal sector does not pay any tax for producing traditional charcoal. If the company paid VAT, 10% of its income from sales will be deducted, making it unable to compete with traditional charcoal. Together with the government, they developed a proposal to be exempt from paying VAT for three years, increasing its profit margin by 10% and allowing green charcoal to be competitive in the market. Talamanca emphasized that governments and international organizations can play a role to enable green businesses to thrive.

As a result of these innovations, the company was able to grow. Producing two thousand tons of green charcoal was able to save 175,000 trees, conserve forest area equivalent to almost 200 football fields, and reduce 32,000 tons of carbon emissions. The new target is to achieve the same savings in one year instead of five years. There were plans to invest in building a new factory in 2017 and to share the green charcoal business model with other countries.

Based on his company's experience, **Talamanca** offered the following conclusions: first, scale is important to make an environmental impact, so green businesses need to grow; and second, innovation is not just about new technology but can also happen in other business areas, such as the supply chain, marketing, and internal process. He added that his message for youth interested in maximizing their environmental impact through green business is "not to sell what you can do, but do what you can sell." In other words, youth entrepreneurs should produce something that is competitive in the market, and the scale will make the environmental impact.

Presenter #3: *Katerina Kimmorley*

Kimmorley is the founder and director of a solar business in India that provides solar lighting solutions across city slum communities. Pollinate Energy-India's model incubates micro-entrepreneurs, so that local city slum communities can provide green products to their own community members.

Based on her company's experience, city slum communities, or people who live at the bottom of the pyramid, do not get access to needed innovative technologies. When Pollinate Energy-India did a country market assessment, they worked with major microfinance organizations to see whether they would provide green products. The microfinance organizations responded that the communities were too poor and too risky to gain access to finance green products and that Pollinate would have to prove that payment would equal sales. Instead, she proposed that innovation needs to happen in the distribution mechanism, where existing technologies can reach these communities. Furthermore, in order for green businesses to make an impact, they have to be able to scale. Pollinate Energy-India entered the Indian market the same year as Uber and also utilized a phone-based payment platform to run its micro-business, transforming its ability to scale, from 10-20% per month to 100% per month, and expanding across four of India's biggest cities. Kimmorley projected that the application of both hardware and software technologies will be the avenue for disruptive innovation in the green business space.

Presenter #4: *Phat Nguyen*

According to **Nguyen**, the Inclusive Business Accelerator (IBA) works in a variety of sectors, including culture, renewable energy, water, forestry, and IT, and much engagement, incubation, and acceleration has taken place. Among these, the IBA also supports innovation in electronics traceability with applications in both aquaculture and agriculture, and tracking from the farm to the retail space. Two startups have received investor funding for electronic traceability, where they built a large network of collaborator companies who could be both customers and providers for the services provided by the traceability company. Another startup helped address salinity intrusion in the Mekong River by using technology from the Netherlands to provide solar power and mobile container, which can desalinate five cubic meters of water and serve around a thousand people per day in a cost-effective way. This solution can be used for disaster relief effort or in remote areas.

In addition to technology development in-house, start-ups are encouraged to receive technology chains. As an example, a solar parabola lamp can be sold for $6,500 for 48 square meters and serve up to 20 households. IBA works with a German producer and a Thai university by building the production ecosystem, receiving the technology, and getting accreditation in Viet Nam. However, in Viet Nam, Nguyen shared that there had been difficulties in retaining talent who can support development of these ventures and managing market demand.

Nguyen said that technology transfer, particularly in developing Asia, will depend on the country. Generally, each country's Ministry of Science and Technology facilitates technology transfer and conducts a mapping study to identify where the needed technology can be procured, whether it is a country or an organization. In the end, technology chains are complex and many resources, expertise, intellectual property, law, technology transfer, and social and human components will be attached. Entrepreneurs should take advantage of services provided by government agencies handling technology and innovation.

Presenter #5: *Patrick Chan*

Chan stated that there are many innovative green businesses in action, where innovation comes through the business models, technology, or the regulatory and institutional frameworks. There are exciting opportunities to be found by riding the "mega-train of sustainability."

Chan shared examples of green businesses demonstrating innovation in these different areas.

- The Eco-Hat is an example of a technology innovation. The Eco-Hat is made of super-absorbent material, which can retain sweat for several hours and does not drip. The hats are produced in a factory in Viet Nam, which reduces costs. The Eco-Hats are useful for warm weather, especially with the threat of climate change, and can be used for sports, outdoor work and activities, and youth. The current cost of the Eco-Hat is $20 SGD, which is expensive. To mainstream the Eco-Hat innovation, economies of scale are needed to drive down the cost. To scale up production, one possible avenue is to target the non-consumers market, which is not looking at buying specific products or services due to various factors, such as cost, time, or convenience. Farmers can be a possible population under the non-consumers market, of which there are millions in Asia and can use the Eco-Hat while working.
- In Bangladesh, business model and regulatory framework innovations were necessary to facilitate greater use of solar energy. Initially, solar technology uptake by the community was limited, as it was cost-prohibitive. ITCO, an infrastructure development company, stepped in and provided financing to help drive the cost down to make the price of the technology equivalent to the price of kerosene.
- SunSeap Enterprises is a solar leasing business, which allows companies to adopt solar technology without having to pay upfront costs. Developers can derive revenue from fees and tariffs from generated solar electricity. Companies who lease solar can tap solar electricity from rooftop and non-rooftop sources. Smart grid infrastructure and a favorable regulatory and policy framework put in place by the Energy Market Authority of Singapore have allowed SunSeap to be a wholesaler and retailer of electricity in the country. As a result, the company has grown from its original pipeline of 50 megawatts to international projects in India (120 megawatts) and Thailand (20 megawatts) and a possible public listing in 2017.

Discussion

The panel discussed what the priorities should be for advocacy or actions around green business development, including government support and regulations.

Kimmorley shared that while having good targets in India has been helpful, her company has tried to stay away from the government in every aspect of its business. While complying with regulations, the company deliberately avoided handouts from the government and paying any fees or bribes. The fact that the company was a green business was not relevant for regulators.

Talamanca agreed that it is not easy to work with the government. His experience in Cambodia was that the government isn't aware of what happens on the ground, including the challenges of green business development. In the ministries, there were directors of departments who were willing to help and open to reasonable proposals that needed a little bit of help to become competitive with the current solution and can be adopted on a wide scale.

Nguyen agreed that businesses need to work with governments in order to operate. As an NGO, Nguyen's organization can be part of the larger policy advocacy groups that help the government develop policies supporting green business. Both businesses and advocacy groups need to be active in approaching governments for support, especially in developing countries, so that results can be generated.

Question #1: *An audience member asked how innovation can be stimulated from the ground up.*

Sundahl answered that, to get new people to adopt something, it is not enough that it solves a practical problem in their lives, as people are not actively trying to go green. Rather, innovations must also be understood in their right social and emotional dimensions to fit with the people's values.

On the other hand, **Chan** suggested to start from a business idea or from prototypes that were developed. He recommended reaching out to innovators, and said that one could perhaps start off with a business plan competition organized at the community level or in schools. Youth in particular have very innovative ideas. There are also makers' fairs, where prototypes can be available. Venture support can be in terms of market access, mentoring, business advisory, initial seed funding, or angel investment, among others.

Question #2: *Another audience member asked about how to take new, innovative businesses to the mass market and particularly to very low-income customers.*

Nguyen acknowledged that there are challenges in generating a natural flow of income generation for low-income populations, unless innovative models are used. In Mozambique, Viet Nam, and Bangladesh, Nguyen's company tried mobile movie viewing and piloted a model to develop a network of low-income agents who could play the video, take a questionnaire, and have product demonstrations, in order to collect feedback from the local community. That information would be fed via mobile phone to the cloud, which would be fed back to a data analysis facility. By developing such an agency network, it could help a system of distributors and educators who could directly impact the community, rather than low-income earners benefiting from a new product.

Talamanca added that in addition to being marketed to the poor, green products have to be of good quality and marketed as high-end. Low-income earners will not patronize low-end products, because they don't want to feel poor. In Cambodia, he observed that many people own fake iPhones and Samsungs, even if they cannot afford books for their children. As a result, the green charcoal is marketed on social media, sold in mini-marts and supermarkets, and used in high-end restaurants, and multiple income level earners buy the product.

Kimmorley shared that her company conducted a willingness-to-pay analysis about aspirational products and found that the majority of people in the target communities was willing to pay twice for a solar-powered phone charger than they were for a solar-powered light. The business case for the bottom of the pyramid is about scale, since the margins are very low. Software

technologies that achieve scale, such as in sharing economy businesses like Uber and Airbnb, are necessary.

Question #3: *Another audience member followed up on the hardware-software interlinkage and asked how green business can be mainstreamed within ICT and how software can be successfully incorporated.*

Kimmorley answered that the most successful and innovative businesses have low assets but have the sharing economy models that enable businesses to scale very quickly. This type of innovation is needed for green businesses to scale up.

Sundahl shared that in the case of the iPhone, a complex software engineering environment was not necessary to develop disruptive software that can be sold on a wide scale. In the process, these kinds of innovative opportunities are not only about whether there are consumers, but they are also creating a way for people to make money.

Nguyen added that the combination of both software and hardware would make businesses much more competitive.

Chan linked this back to Bangladesh's million solar home system program, whereby many of the villagers are making payments based on micro-credit and micro-financing, using mobile payment systems. They use technology when they do not have access to physical banking facilities. Another example was the reverse vending machine, where people bring recyclable items, such as plastic bottles, metal cans, glass bottles, and others, and earn money in return. These machines are starting to appear in Europe, Taiwan, and the PRC, where the reverse vending machines give mobile credits instead of bills.

Question #4: *Baptist asked each panelist to share key messages for the audience.*

For **Chan**, mindset and paradigm shifts are possible by applying disruptive, innovative models to existing products. Sustainability is a mega train of business opportunity and is there for everyone to seize as green entrepreneurs. In particular, ICT is an enabling technology for green innovations and can contribute to developing "green trade-ups", or greener versions of existing goods and services.

Nguyen encouraged start-ups to fail but fail smart. Failing early is good and can lead to results.

Sundahl's tip was to look for areas where people lack opportunities for both consumption and earning and try to match those needs without thinking strictly about the practical dimensions. Instead, the practical, social, and emotional dimensions must all be considered and ensured that they make a match.

Kimmorley's challenge was for everyone to consider how to disrupt harmful or obsolete products out of the market. Using the example of the energy sector, she posed the question of how people can turn kerosene and coal into the next Kodak.

Talamanca shared his belief that green business is the business of the future - not because everybody wants to save the environment, but because markets are going to judge companies and choose green products. Ninety-nine percent of an iPhone's packaging comes from recycled or other sustainable sources of paper. Apple does this, not because it is a green company, but because it is aware that it must adapt to the sustainability of the future. In ten

years, those who are already thinking about sustainability will still be around because they are sustainable and competitive.

Baptist added two key messages from the discussion. First, in terms of innovation along the supply chain in addition to technology, there can be innovation in distribution, marketing, or other parts of the supply chain. Second, scale is important to achieve impact, and there is a need for more products that will be used heavily and ubiquitously so that the environmental benefits can be maximized.

Summary and Closing Remarks

Diwakar Gupta, Vice-President for Private Sector and Cofinancing Operations, ADB

On behalf of the Asian Development Bank, I would like to thank the distinguished guests and panelists for participating in this Green Business Forum for Asia and the Pacific, the first of its kind.

At the start of this forum, we set out to raise the profile of green businesses and their potential to address the environmental challenges in this region. In the last 2 ½ days, I think you will agree that we have been successful in doing this, and that we have collectively planted what we hope are seeds for actions that will scale up green businesses in the region.

Let me summarize what I hope would be some of the key takeaways from this forum.

First, there is a huge potential to scale up green businesses in this region. The trends show that the established sectors, such as green energy and pollution management, will continue to expand in the coming years, particularly in this region. We also saw that there are several opportunities in underserved sectors, such as natural capital, sustainable agriculture, and ecotourism.

Second, technology and innovation supported by a greater environmental consciousness among consumers are driving the shift to sustainable management of natural resources and sustainable consumption and production. Greening initiatives need to be seen as opportunities rather than costs. Education and awareness-raising will also be important in this respect. We are encouraged that civil society and the youth are very well represented in this forum.

Third, there is much interest and resources from the private sector to invest in green businesses. Green business opportunities must be structured and packaged in a language that can be understood by the private sector, showing investment opportunities with both direct, attractive, risk-adjusted returns as well as other indirect benefits. Indirect returns on investments will need to be identified and measured. For example, outcomes of conservation actions may translate into cost of saving or investments in natural capital may make good business sense in order to minimize supply chain risk. The appropriate scale of investments will have to be determined. Investments in natural capital must be sustainable, and therefore, also benefit stakeholders who depend on natural capital for their livelihood.

For this purpose, the private sector, academic and environmental organizations, and development institutions such as ADB must work together to find approaches and models that can accommodate the interests of various stakeholders.

Fourth, governments have a key role to play in terms of providing a policy and regulatory framework that would encourage and support the adoption of green businesses. Appropriate regulations, including market-based instruments, standards, and sustainability targets can stimulate companies to adopt green practices. The collection and disclosure of information, for example on pollution discharges and GHG emissions, can incentivize businesses to be greener.

As businesses and society transition to green practices, it is also important to look at possible losers and find ways that they can be supported.

Last, knowledge and partnerships will be important to realize the actions to scale up green businesses. We need to bring in knowledge from those who have the experience and working models, and find out how it can be applied in the region.

We need to encourage partnerships for those actions that need to be worked upon together. For example, they can demand the business sector for green research and technology, and on the science of conservation business. This is also an area where ADB has started to implement initiatives, such as this forum, and other related studies on natural capital investments and market-based instruments.

ADB will continue its efforts to upscale the more established green investment sectors, such as renewable energy. We will do more on knowledge sharing and partnerships for green businesses, and further support innovative policy and regulatory reforms and initiatives in our developing member-countries that support development of green businesses. We will also need to support more green finance, as we are starting to do in the PRC.

To conclude, I would like to thank the moderators, speakers, exhibitors, and other guests for sharing their insights and experiences with all of us. I wish all of you a safe journey home.

Thank you.