



October 25 ~ 27, 2021

Global Green Growth Week 2021

Green Recovery, Green Jobs, and Net Zero2050

Record of Proceedings

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PROGRAM

Day 1: 25 October 2021

Africa-Europe- Middle East			Nature-based Solutions for Sustainable Development and Human Wellbeing in Africa [10:00-11:55 GMT+3]		Circular Economy and Waste Management: Unlocking potential for Green Job Creation [09:00-10:30 GMT+0]		Scaling-up Renewable Energy through Innovation and Blended Finance Solutions [09:00-10:30 GMT+0]
Asia-Pacific	GGGWeek2021 Official Opening ¹ (by Frank Rijsberman, GGGI Director- General) [9:30-9:40 GMT+9]	Low Emissions Climate Resilient Development in the Pacific [9:40-10:40 GMT+9]	The role of Green Investments & Innovative financing mechanisms [11:00-13:00 GMT+9]	Electric Mobility Transition: Insight from Emerging Economies in Asia and Africa Time [14:00- 15:45 GMT+7]	Energy Efficiency: Pathway to sustainability [16:00-17:40 GMT+9]	Inclusive Green Growth: Partnership for Climate Resilient Urban Development [16:00 - 18:00 GMT+9]	Green Recovery Approaches and Innovative Finance for Developing and Emerging Economies [17:00-19:00 GMT+9]
Latin America - Caribbean			Green Growth Measurement and Innovative Tools to Assess Performance in Sustainable Development Goals (SDGs) Time [9:00-11:00 GMT-4]		Green Entrepreneurship: Innovative Business Models & Potential for Green Jobs Creation [16:00-18:00 GMT-5]		

Day 2: 26 October 2021

Africa- Europe- Middle East	Climate Smart	Innovations and	Enhancing
	Agriculture: Unlocking	Green	Countries'
	the potential of	Entrepreneurship in	Direct Access to
	Innovation and Climate	Africa: Unlocking the	Climate Finance
	Risk Insurance for	potential for Green	(Africa and the
	Smallholder farmers in	Job Creation and	Middle East)
	Africa	Green Recovery	[10:00-11:30
	[08:00-10:00 GMT+0]	[09:00-11:00 GMT+0]	GMT+0]

¹ The GGGWeek2021 Official Opening will be announced by GGGI Director-General at the beginning of the first session "Low Emissions Climate Resilient Development in the Pacific" at 9:30 A.M. KST (GMT+9) on October 25th, 2021.

Asia-Pacific	The Evolution of Carbon Pricing Policies and Market Mechanisms [11:00- 12:00 GMT+9]	Enhancing Countries' Direct Access to Climate Finance (Asia and the Pacific) [13:00-14:00 GMT+9]	Sustainable Landscape and Climate Smart Agriculture Solutions in Asia/Pacific [14:00-15:30 GMT+9]	Waste-2-Energy Potential to scale-up renewable energy access: Examples of Biofuels [14:00-16:00 GMT+9]	Accelerating progress on Korea's Net Zero 2050 target [15:00-16:30 GMT+9]	Greenpreneurs Global Program 2021 Edition [16:00-17:30 GMT+9]	Closing the Loop: Circularity in the Built- Environment [16:00-17:40 GMT+9]	Long-term strategies, NDCs, and BTRs: Tools and Lessons for 2050 net-zero [17:00-19:00 GMT+9]
Latin America - Caribbean		Nature-based Solutions, Agroforestry Concessions and Sustainable Landscape initiatives [10:00-13:00 GMT-5]						

Day 3: 27 October 2021

		Unlocking the		Urban Resilience				
		potential of		Building:				
Africa-		Climate Finance &		African Cities' Green				
Europe-		Carbon Pricing in		Growth in a changing				
Middle East		Africa		climate				
		[9:30-		[13:50 -16:20				
		11:00 GMT+1]		GMT+0]				
	Increasing	Implementing	Blue Economy &	Green Hydrogen	Scaling-up	The Road to	Greening	Circular
	Access to	NDCs in the Pacific	Coastal Resilience	Economy in	Renewable	COP26: what does	Buildings and	Economy &
	Climate	[12:00-13:00	Building: Climate	GGGI member countrie	Energy Solutions	success look like	Infrastructure in	Waste: Views
	Finance in	GMT+9]	Smart Solutions for	S	for Ambitious	for developed and	Asia:	from donors,
Asia-Pacific	the Pacific		Sustainable		Net-Zero 2050	developing	Certification,	countries,
	[09:00-		Livelihood in	[14:00-16:00 GMT+9]	Targets	countries?	Partnerships and	and private
	10:30		Asia/Pacific		[15:00-16:00	[16:00-18:00	Finance	sector
	GMT+9]		[14:00-16:00		GMT+9]	GMT+9]	[16:00-18:00	[17:00-19:00
	_		GMT+9]			-	GMT+9]	GMT+9]
			Greening LAC's					
			Financial Systems					
Latin			Experience from the					
America -			banking sector and					
Caribbean			capital markets					
			[09:00 - 11:00 GMT-					
			5]					

INDEX OF SPEAKERS & MODERATORS

Α

Achala Abeysinghe

Aaron Adu

Aaron Russell

Abayneh Mekonnen

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Abdullah Khair

Achala Abeysinghe

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Ahmed Himy

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Akachukwu Okafor

Akesiu Meimoana Leua Kautoke

Aklilu Fikresilassie

Alberto Dante Maurer Fossa

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Ali Kerem Savsel

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Amit Singh

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Anas Felhi

André Weidenhaupt

Andrei Marcu

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Bertha Chiudza

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Chengchen Qian

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Christophe Assicot

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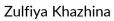
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Wilbert van Rooij

Yatin Choudhary Yeawon Kim Yogendra Chitrakar Young-Sook Yoo YoungTak Kim Yusuke Taishi

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AFFILIATION OF MODERATORS & PRESENTERS

ACTIVIST

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Adventist Development and Relief Agency (ADRA)

Africa Rice

Agence Marocaine pour l'efficacité énergétique (AMEE)

Angaza Ltd

ART-PESOUNG

ASEAN Center for Energy

ASHIA International

Baker McKenzie's Environmental Markets Practice

Bappenas, Indonesia

Bloom Energy Korea

BOS - Plan Senegal Emergent

British Embassy to Republic of Korea

Business Partnerships for Global Goals BP4GG (UK's Foreign Commonwealth and Development Office program)

CCAFS, ICRISAT, West and Central Africa Office, Bamako Mali

Centre for Social Innovation

Change Partners International

Chiang Mai University, Thailand

Chilean Embassy to Republic of Korea

Cities and Villages Development Bank, Jordan

City of Kigali, Rwanda

CityNet

Climate Change and Development Authority, Papua New Guinea

Climate Change Center

Climate Change Competencies Centre (4C Maroc)

Climate Diplomacy, British Embassy Seoul

Climate Finance Access Network

ClimateWorks Australia

Close the Loop Ltd.

Council on Energy, Environment and Water (CEEW), India

Danish Embassy in India

Danish Energy Agency

Danish Energy Agency, Centre for Global Cooperation

Deltares

Department of Energy, US Embassy Seoul

Department of Process Engineering, University of Pannonia

Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)

Development Alternatives, India

Eco-systems Group SAS

EDEC (Business and Community Development Company)

Embassy of Argentina in Republic of Korea

Energise Africa

Energy Commission of Nigeria

Energy Regulatory Commission of Mongolia

Enpro Envirotech Pty Ltd

ENVELOPS CO., LTD.

Environment and Coffee Forest Forum (ECFF)

Environment, Forest and Climate Change Commission (EFCCC), Ethiopia

ESG Committee, POSCO

ESG Planning Team, Shinhan Investment Corp.

Ethiopian Biodiversity Institute

European Environmental Bureau

EUWELLE Environmental Technologies GmbH

Except Integrated Sustainability

Fiscal Policy Agency, Ministry of Finance, Indonesia

Foreign, Commonwealth & Development Office (FCDO), UK

French Development Agency (AFD)

Fundação Amazônia Sustentável

Gates and Bytes Limited

Green Climate Fund

GENERATION FEMME DU TROISIEME MILLENAIRE (GFM3)

Global Green Growth Institute (GGGI)

GLI Technical Committee

Global Challenges Foundation

Global Infrastructure Basel Foundation

Global Shea Alliance

Green Building Council Finland

Green Economy Coalition

Green Growth Knowledge Partnership (GGKP)

Green Road Waste Management Pvt. Ltd

Green Technology Center Korea

GreenA Consultants Pte Ltd

GreenCare Rwanda

Greeningfinance.org

Growth Dialogue

Hyundai Motors

IHS Markit - Regional ESG Trends

IIED

Institute for Development of Economics and Finance, Indonesia

Institute for the Economy and Environment, University of St Gallen

Institute of Environmental Sciences, Boğaziçi University

International Energy Agency

IOCL (Indian Oil Corporation, India)

IRESEN, Morocco

IUCN

Kep municipality, Cambodia

Kiira Motors Corporation

Klik Swiss Foundation

KOGAS

KOICA

KotaKita

La Banque Agricole du Senegal

Landmark LTD

Latin America and the Caribbean Finance Group, GFLAC

Lestari Capital

Literacy Action And Development Agency (LADA)

Ministry of Agriculture, Burkina Faso

Ministry of Climate and Environment, Norway

Ministry of Energy and Mineral Resources, Indonesia

Ministry of Energy Transition and Sustainable Development, Morocco

Ministry of Environment and Sustainable Development, Cote d'Ivoire

Ministry of Environment, Lands and Agriculture Development (MELAD), Republic of Kiribati

Ministry of Environment, Rwanda

Ministry of Finance, Kiribati

Ministry of Finance, Perú

Ministry of Foreign Affairs, Republic of Korea

Ministry of Infrastructure. Rwanda

Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication (MEIDECC). Kingdom of Tonga

Ministry of Petroleum and Natural Gas, India

Ministry of the Environment, Climate and Sustainable Development, Luxembourg

Ministry of Water Supply, Nepal

Ministry of Youth and Culture, Rwanda

Mongolia Green Finance Corporation (MGFC)

Mott MacDonald

National Banking and Securities Commission of Mexico (CNBV)

Natural Resources and Environment, National Economic and Development Authority (NEDA)

Government of Philippines

Neron Energy

New Zealand Embassy to the Republic of South Korea

OECS Commission

Office of the Chair of the LDC Group under UN Climate Change

Palau Energy Administration

Peruvian Society for Environmental Law (SPDA)

Philippines Green Building Council

PIMA Zero Waste Store

Praj Industries Ltd, India

Prime Ministry, Burkina Faso

Proteen

PT Nusatama Berkah

PULA Advisors

RE Power Group, Thailand

Rebel Group International

Rioimpact

RMIT

Roundtable on Climate Change and Sustainable Transition (ERCST)

Royal Norwegian Embassy in Colombia

Rwanda Environment Management Authority

RWE

SarVision

Sceretariat of the Pacific Regional Environment Programme (SPREP)

School of Environment, Nanjing University

SEED

Sekolah Tinggi Teknologi Industri (STTI) Bontang

Seoul National University, Asia Centre

Shanghai Jiao Tong University, School of Environmental Science and Engineering

Siemens

Solid Waste Coordination and Management Unit, Senegal

Stanford University

STEAM Women

Student Energy (SE)

Sustainable Mobility Unit, Economy Division, UNEP

Sustainable Urban Economic Development Programme - SUED

Technological Center for Industrial Circular Economy of the Province of Buenos Aires, Argentina

TERI

The City of Dakar, Senegal

The Green Protector

The Ndiob City, Senegal

The Pacific Community (SPC)

The Thai Biogas Trade Association, Thailand

The University of Utah Asia Campus

The World Bank

TUV NORD Indonesia

UK BEIS

UK PACT

UNDP

UNECA

UN-ECLAC

UNEP

UNEP and DevTech Systems, Inc.,

UNFCCC

UNFCCC Regional Collaboration Centre (RCC) St. George's

UNICEF East Asia and Pacific Regional Office (UNICEF EAPRO)

Unilever Ltd; Zawgyi Premier Co., Ltd

Universidad Nacional de Itapúa (UNI)

Universidad Nacional de Asunción

University Institute of Initial and Continuous Training (IUFIC) / Thomas SANKARA University

University of Cologne

University of Kansas

Usavers

Vanuatu Business Resilience Council

Vietnam 2050 Calculator

Volkswagen Mobility Solutions

Wetlands International

World Agroforestry (ICRAF)

World Bank

WRI Africa

WRI ZCB Accelerator

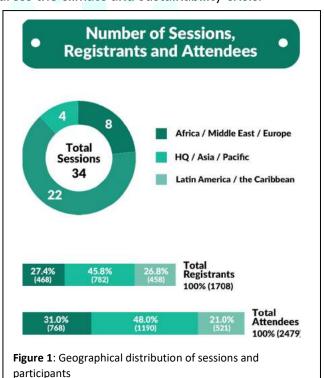
Youth Climate Lab (YCL)

EXECUTIVE SUMMARY

The <u>Global Green Growth Institute</u> (<u>GGGI</u>), headquartered in Seoul, South Korea, is an intergovernmental organization founded to support and promote a model of economic growth known as "green growth," which targets key aspects of economic performance such as poverty reduction and job creation, as well as social inclusion and environmental sustainability. GGGI partners with countries, multilateral institutions, government bodies, and the private sector to help build economies that achieve strong growth and are less carbon intensive, more resilient to climate change, and more efficient and sustainable in the use of natural resources.

The Global Green Growth Week is GGGI's flagship annual conference – organized in the margins of GGGI's Assembly and Council joint session – to bring together green growth leaders and practitioners, forges partnerships, and provides participants with learning and sharing opportunities across a range of sectors and topics to advance the global efforts to address the climate and sustainability crisis.

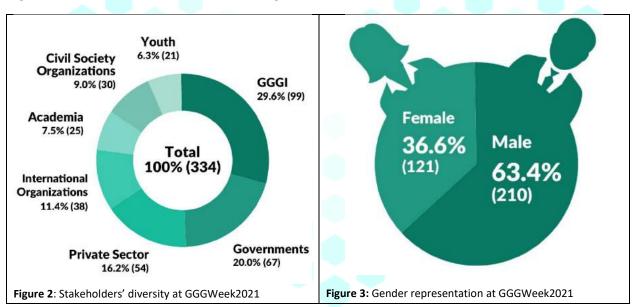
The 2021 edition of the Global Green Growth Week (GGGWeek2021) took place on October 25-27, 2021, with the theme: Green Recovery, Green Jobs, and NetZero2050. GGGWeek2021 featured high-level panel discussions, keynote speeches, interactive sessions and debates that highlighted examples of solutions and best practices to green COVID-19 recovery, develop Green New Deals to accelerate the implementation of the Paris Agreement. The "follow the sun approach" used to design the program allowed to have 8 sessions for Africa-Europe-Middle East, 4 sessions for Latin America & Caribbean, and 22 sessions for Asia-Pacific, all organized during times that are most convenient to presenters and stakeholders, with about 2,500 participants in total (Figure 1), and GGGI spent less than USD25,000 for the costs of simultaneous interpretations, zoom licenses and other support consultancy assignments.



The 200+ presentations from GGGWeek2021 covered all the Programmatic Solutions GGGI's Strategy 2030 focuses on (Table 1). The topics discussed were related to Green New Deals, Green Recovery, Green Investments, Innovative financing mechanisms, Private sector engagement for scaling up, Nature-based Solutions, Adaptation and resilience building, Climate smart agriculture, Sustainable green industrial parks, Carbon pricing, NDCs/LEDS/MRV, Blue economy & coastal resilience, Sustainable forests, Green cities, Sustainable transport, Circular economy & waste management, Green industries, Scaling-up renewable energy, Techno-climate innovation, Green entrepreneurships, Public Private Partnerships.

Programmatic Solutions	Africa-Europe- Middle East	Latin America & Caribbean	Asia- Pacific	Total
Green Investments	3	1	5	9
Climate Actions	1	3	8	12
Climate Resilient Agriculture	2	-	1	3
Sustainable Forests	2	1	1	4
Coastal Resilience		1	1	2
Waste Management	1	1	3	5
Sustainable Mobility		-	1	1
Green Buildings	1		3	4
Solar PV	2	-	3	5
Green Industries		- 70	2	2

Figures 2 and 3 present the diversity and gender representation from GGGWeek2021.



The 8 sessions of the Africa-Europe-Middle East group were structured around the following topics:

- Circular Economy and Waste Management: Unlocking the potential for Green Job Creation
- Climate Smart Agriculture: Unlocking the potential of Innovation and Climate Risk Insurance for Small-hold farmers in Africa
- Nature-based Solutions for Sustainable Development and Human Wellbeing in Africa

- Urban Resilience Building: African Cities' Green Growth in a changing climate
- Unlocking the potential of Climate Finance & Carbon Pricing in Africa
- Scaling-up Renewable Energy through Innovation and Blended Finance Solutions
- Innovations and Green Entrepreneurships in Africa: Unlocking the potential for Green Job Creation and Green Recovery
- Enhancing Countries' Direct Access to Climate Finance (Africa and the Middle East)

The 4 sessions of the Latin America & Caribbean group were structured around the following topics:

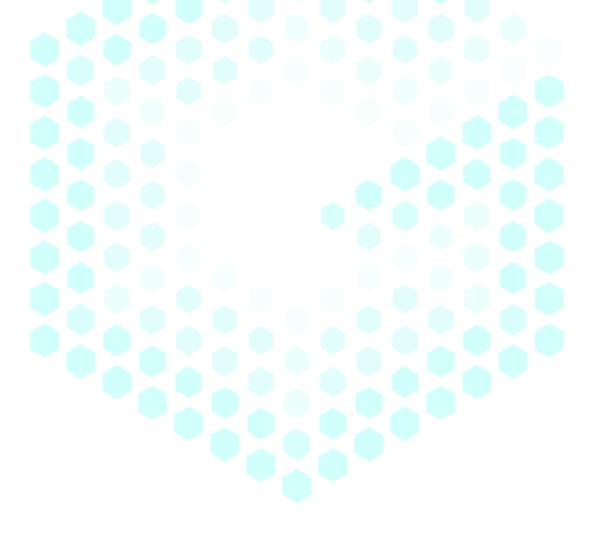
- Green Entrepreneurship: Innovative Business Models and Potential for Green Jobs Creation
- Green Growth Measurement and Innovative Tools to Assess Performance in SDGs
- Greening Latin America and the Caribbean's Financial Systems: Experience from the Banking Sector and Capital Markets
- Nature-based Solutions, Agroforestry Concessions and Sustainable Landscape Initiatives

The 22 sessions of the Asia-Pacific group were structured around the following topics:

- Circular Economy & Waste: Views from donors, countries, and private sector
- Long-term strategies, NDCs, and BTRs: Tools and Lessons for 2050 net-zero
- Closing the Loop: Circularity in the Built-Environment
- Energy Efficiency: A Pathway to Sustainability
- Greening Buildings Infrastructure in Asia: Certification, Partnerships and Finance
- Waste-2-Energy Potential to scale-up renewable energy access: Examples of BioCNG and Biofuels
- Blue Economy & Costal Resilience Building: Climate Smart Solutions for Sustainable Livelihood in Asia/Pacific
- The role of Green Investments & Innovative financing mechanisms
- Scaling-up Renewable Energy Solutions for Ambitious Net-Zero 2050 Targets
- Green Hydrogen Economy in GGGI member countries
- Accelerating progress on Korea's NetZero 2050 target
- Electric Mobility Transition: Insight from Emerging Economies in Asia and Africa
- Enhancing Countries' Direct Access to Climate Finance
- The Evolution of Carbon Pricing Policies and Market Mechanisms
- Sustainable Landscape and Climate Smart Agriculture Solutions in Asia/Pacific
- Inclusive Green Growth: Partnership for Climate Resilient Urban Development
- Green Recovery Approaches and Innovative Finance for Developing and Emerging Economies
- The Road to COP26: what does success look like for developed and developing countries?
- Low Emissions Climate Resilient Development in the Pacific
- Increasing Access to Climate Finance in the Pacific
- Greenpreneurs Global Program 2021 Edition
- Implementing NDCs in the Pacific

Throughout the event, GGGWeek2021 brought together policy makers, financiers (MDBs/private banks/institutional investors), experts, academia, civil society organizations, technology developers, representatives from various industries, and partners interested to shared ideas, discuss solutions, and contribute to drive the green growth transformation. GGGWeek2021 also served a forum to forge new partnerships and networks, and strengthen the existing ones. The comprehensive knowledge products prepared from GGGWeek2021 is available on GGGI's website to all our internal and external stakeholders to access and use.

One behalf of GGGI's President of the Assembly and Chair of the Council, H.E. Ban Ki-moon, and our Director General, Frank Rijsberman, we extend our deep appreciation to the speakers, panelists, session chairs and moderators, and the GGGWeek2021 Coordination Team.



GGGWeek2021 COORDINATION TEAM

CORE TEAM











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Martin Ho

Marina Brenden

Cristina Villaveces Spir









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Hee Kyung Son

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Maria Cecilla Pana

Angela Nantulya

Na Youn Kim

Ye Won Kim

AFRICA-EUROPE-MIDDLE EAST SESSIONS

Overview of sessions

25 October 2021	26 October 2021	27 October 2021
Nature-based Solutions for	Climate Smart Agriculture:	Unlocking the potential of
Sustainable Development and	Unlocking the potential of	Climate Finance & Carbon
Human Wellbeing in Africa	Innovation and Climate Risk	Pricing in Africa
	Insurance for Smallholder	
	farmers in Africa	
Circular Economy and Waste	Innovations and Green	Urban Resilience Building:
Management: Unlocking	Entrepreneurship in Africa:	African Cities' Green Growth in
potential for Green Job Creation	Unlocking the potential for	a changing climate
	Green Job Creation and Green	
	Recovery	
Scaling-up Renewable Energy	Enhancing Countries' Direct	460
through Innovation and Blended	Access to Climate Finance	
Finance Solutions	(Africa and the Middle East)	
		Global Green Growth Week 2021

Welcoming remarks by GGGI President & Chair H.E. Mr. Ban Ki-moon



Dear distinguished participants, Ladies and gentlemen,

It is my pleasure to welcome all of you—the moderators, speakers, panelists, and all participants—to this session of the Global Green Growth Week 2021 for Africa, Europe, and the Middle East regions.

Although this year's GGGWeek will take place virtually due to the COVID-19 pandemic, my hope is that it will be more "green", provide an opportunity for broader participation from more regions and sectors of the world, and ultimately lead to bigger impacts.

Regardless of where we live, / we are all faced with two urgent challenges: tackling the climate crisis and recovering from the pandemic.

Extreme weather changes continue to pose a threat to food and water security, infrastructure, and public health.

But it is not just extreme weather events and natural disasters.

We can read and hear—almost on a daily basis now—about how climate change fuels conflicts, spurs migration, and poses serious health risks to people everywhere.

Therefore, I urge you to discuss the key topics pertaining to these regions, so we can unleash the potential to strengthen climate resilience and accelerate a green COVID recovery.

I am very proud that GGGI has been actively supporting its Member countries develop nature-based solutions by way of sustainable landscapes and climate smart agriculture; implement "green" COVID recovery by generating green jobs; and strengthening vulnerable Member countries' adaptation through National Adaptation Plans, flood resilience capacities, and more.

It is crucial that we keep the current momentum going and continue to work together to further develop innovative new ideas and solutions.

GGGWeek2021 sessions for Africa, Europe, and the Middle East will cover green entrepreneurship, green and climate finance, nature-based solutions and sustainable forests, circular economy and waste management, urban resilience building, and much more, all to help achieve the Sustainable Development Goals.

I would like to express my appreciation for your valuable participation in this year's GGGWeek, and I wish each and every one of you all the best in strengthening existing partnerships and developing new ones.

Thank you.



Session details

1 Nature-based Solutions for Sustainable Development and Human Wellbeing in Africa

♣ Agenda	
10:00- 10:10	Welcome Remarks and Introduction to Global Green Growth Institute (GGGI) H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Dr. Gemedo Dalle, GGGI Ethiopia Country Representative
10:10- 10:40	Session I. Panel Discussion Chair: Dr. Gemedo Dalle
	 Panelists: H.E. Professor Fekadu Beyene, Commissioner, Environment, Forest and Climate Change Commission (EFCCC) Mr. Charles Karangwa, Regional Head of Land Systems and IUCN Country Representative, Rwanda Dr. Tadesse Woldemariam, Executive Director, Environment and Coffee Forest Forum (ECFF)
10:40- 11:30	 Dr. Adefires Worku, National Coordinator, GLI Technical Committee - Nature based solution projects implementation in Ethiopia: success and challenges (10:40-10:55 am) Mr. Lamine Bruno Morin, Green Emerging Senegal Plan and reforestation in Senegal (10:55-11:10 am) Mr. Aaron Adu - Action for Shea Parklands: Promoting a Pro-Poor, Pro-Business Landscape Restoration in West Africa (11:10-11:25 am) Mr. François Xavier Tetero and Liliane Mupende - Nature-based solutions for flood risks reduction in the Rwanda's capital city and secondary cities (11:25-11:40 am) Ms. Marie Veyrier - Promoting Rural Resilience through the Integrated Farming Module - A local led nature based farming in rural West Africa (11:40-11:55 am)
11:30	Closing

Summary

Nature-based solutions (NbS) are actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits.²

NbS have garnered significant interest and momentum worldwide, with scientific evidence of the benefits of NbS to the economy, society and environment; and proven solutions for addressing challenges related to climate change, disasters, health, food and water security, employment, and biodiversity. The International Union for Conservation of Nature (IUCN) reports that 37% of NbS for climate mitigation contribute to meeting Paris Agreement goals, NbS provide 1.4 billion people with clean and safe drinking water saving US\$140 billion annually, and NbS contribute an estimated US\$170 billion worth of global benefits annually in ecosystem services.

Despite their potential to address climate and development challenges, NbS are neither consistently implemented nor adequately financed. There is a global call to urgently mainstream NbS in policy instruments and enhance regional and international cooperation to scale NbS for green growth. To facilitate the development and mainstreaming of NbS, IUCN has developed NbS criteria and quality standards to ensure that NbS contribute to the reduction of social and environmental vulnerabilities, and generation of societal benefits; restoration, maintenance and improvement of ecosystem health; and support for equitable governance and capacity enhancement. Based on these standards, IUCN will be launching an NbS certification system in 2022.

Many countries in Africa, including those in West Africa, as well as Ethiopia, Rwanda and Senegal have adopted NbS to address common challenges in land degradation and continued deforestation that are impacting agricultural productivity and sustainable growth, where IUCN proposes a global standard to facilitate the scaling up of NbS (Figure 1).

² Definition by IUCN.

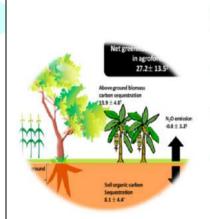
A global standard to facilitate NbS



- Afacilitative standard for design, verification and scaling up of NbS
- 8 criteria and 28 indicators
- Based on knowledge co-creation: conservation science, social science, traditional knowledge;
- 'Crowd-sourced' drafts through two rounds of open. consultation, 800+ people across 100 countries, 1000's of comments, each comment and response tracked:
- · Developed to be compatible with the ISEAL Alliance Code of Good Practice - revised every

Figure 1: A global standard to facilitate NbS (Source: International Union for Conservation of Nature, Charles Karangwa)

In West Africa, the shea industry is rapidly expanding in response to growing global demand for shea butter. Shea parklands occupy over 1 million km² in the Sudano-Sahelian semi-arid zone of sub-Saharan Africa. Surface area with shea parklands in six Global Shea Alliance (GSA) countries – Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali, Nigeria and Togo – amounts to 159 million hectares.⁴ An estimated 7.93 million shea trees are lost annually across West Africa due to factors including climate change, lack of fallow, commercial agriculture and tree removal with tremendous impact on local economies and people (Figure $2).^{5}$



A publication by the Agricultural & Applied Economics Association in 2008 opined that:

- · Conversion of farmland and forests to urban development reduces the amount of land available for food.
- Desertification and deforestation reduce land quality which affects agricultural productivity.
- Parkland loss reduces the amount of CO2 sequestered leading to climate change with its attendant effect of crop yield and livelihoods.
- Every year, shea parklands in West Africa capture 1.5 millions tons of CO2 that they store in the soil contributing substantially to SDG 13.
 - ✓ Per ton of kernel, it would be 1.04 tons of CO2 of carbon footprint.

Figure 2: Effects of parkland loss on local economies and people (Source: Global Shea Alliance)

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³ Journal of Applied Ecology, "Biodiversity in West African parklands promotes pollination of shea," 16 June 2020, https://appliedecologistsblog.com/2020/06/16/biodiversity-in-west-african-parklands-promotes-pollination-of-shea/.

⁴ C. C. Naughton et al., "Land suitability modeling of shea distribution across sub-Saharan Africa," *Applied Geography*, vol. 58 (2015), pp. 217–227.

⁵ GSA.

GSA that aims to help build a more sustainable shea industry has been promoting integrated farming that incorporates NbS. Its integrated farming model is comprised of four components – organic agricultural production, trees on farms, beekeeping and livestock rearing – all of which contribute to improved income and resilience of rural women. These four components provide ecosystem-based services to one another. For example, trees on farms help improve water retention, which improve crop resilience and provide shade for livestock. Based on this model, a project titled, "Developing a Resilient Shea Agroforestry Farm Model" is being implemented in Nigeria to develop skills in integrated farming, including in crop selection, organic fertilizer production, climate-smart farming practices and beekeeping. The model is being piloted in two communities, and GSA is in the process of quantifying the benefits and documenting the lessons learned with the intention to scale the model among its 700 members in 45 countries.

GSA also initiated an Action for Shea Parkland Program to protect the 2 billion shea trees that grow naturally on parklands across 21 African countries, and plant 10 million shea trees, which together amount to 882,000 tons of CO₂ sequestered. The program aims to create jobs for 500,000 women to help sustain shea production and parkland management practices and conduct research to support the shea sector. For example, research by GSA has revealed the importance of biodiversity for shea crop in Africa, and the benefit that shea trees gain from bees moving pollen between their flowers to produce fruits, which are applied to their integrated farming model.

In Ethiopia, coffee farmers are facing challenges related to deforestation, coffee diseases and climate change. The Environment and Coffee Forest Forum has introduced NbS to coffee farmers, and science-based research conducted have shown significant cost savings when NbS are used to overcome diseases and increase productivity. More of such development-oriented research is needed to generate knowledge and practical actions that benefit both the local communities and ecosystems. A multistakeholder coordination platform that brings together both professionals and grassroots civil society is needed to incorporate both scientific and indigenous knowledge in identifying and scaling NbS.

To date, Ethiopia has more than 120 NbS projects amounting to US\$82 billion.⁶ To support the implementation of NbS, Ethiopia has drafted a legislation for ecosystem service payment that states the rights and obligations on ecosystem service providers and users. Nationally, Ethiopia has also implemented a Green Legacy Initiative that is mobilizing communities to voluntarily plant 20 billion seedlings over four years to reduce and restore degraded areas, augment watershed hydrology and improve soil fertility (Figure 3). At the two-year milestone, the initiative planted over 9 billion seedlings.⁷

⁷ Ibid.

⁶ Worku, Adefires. "Nature based solution projects implementation in Ethiopia: Success and challenges," presentation made at Global Green Growth Week 2021, 25 October 2021.

Nature based solutions to enhance social-ecological resilience in Ethiopia and beyond • Promoting Protected Aare system is another age-old nature-based solution in Ethiopia - 27 National Parks - 3 Wildlife Sanctuaries - 5 Wildlife Reserves - 5 Biosphere Reserves - 30 Controlled Hunting Areas - 4 Community Conservation Areas • PA system in Ethiopia cover 10%

Figure 3: Enhancing socio-ecological resilience through Nature-based Solutions in Ethiopia (Source: UNDP, Adefires Worku)

NbS is not limited to rural and agricultural development, but also play an important role in sustainable urban development. In Rwanda, GGGI is providing support in the implementation of NbS for flood and landslide risk reduction in Rwanda's cities through a Green Climate Fund Readiness Programme launched in June 2020. One of the initiatives involves developing and scaling NbS to protect urban areas. Using flood risk models created for selected urban watersheds, the application of various NbS to reduce flood and landslide risks in the urban context at different levels is simulated. At the household level, NbS include permeable pavements, green roofs and urban trees that can contribute up to 40% reduction in peak runoff. At the local level, NbS such as detention basins, swales and storage tanks can further reduce peak runoff.

Policy frameworks that incorporate NbS are important in mainstreaming and coordinating NbS across sectors, and in mobilizing financial and human resources to conduct research and scale innovative NbS like those mentioned above. An example of such framework is Senegal's Green Emerging Senegal Plan. This is a priority initiative of the President of Senegal for the second phase of the Emerging Senegal Plan that forms the reference framework for the country's sustainable development policy over the mid- and long-term. The Green Emerging Senegal Plan aims to contribute to climate change mitigation and adaptation, sustainable management of natural resources, preservation of ecosystems, creation of green jobs, and promotion of the circular economy. The plan is being developed in collaboration with GGGI, and integrates NbS such as reforestation, restoration of salty land, and protection of terrestrial, coastal and marine environments. It adopts a holistic approach that incorporates awareness raising, skills building, scaling of local solutions, and consolidation of the existing network of protected areas. The plan adopts a science-based and multistakeholder approach to fast-track projects and policy reforms, and a framework for the co-construction and co-financing of interventions among public and private actors.

⁸ Tetero, François Xavier and Mupende, Liliane. "Nature-based solutions for flood risk reduction in Rwanda's capital city and secondary cities," presentation made at Global Green Growth Week 2021, 25 October 2021.

Toward green COVID-19 recovery and transition to green growth, NbS must be mainstreamed in national and global agendas. This can be achieved by integrating NbS in policies and plans, breaking the sector silos that we operate in, and fostering cooperation and collaboration to conduct science-based research, mobilize public and private resources, scale proven NbS, and build capacity.

ACKNOWLEDGMENT

Speakers

Mr. Charles Karangwa, Regional Head of Land Systems and Country Representative of Rwanda, IUCN

Dr. Tadesse Woldemariam, Executive Director, Environment and Coffee Forest Forum

Dr. Adefires Worku, National Coordinator, Green Legacy Initiative Technical Committee, Ethiopia

Mr. Lamine Bruno Morin, Senior Program Manager for Infrastructures and Housing, Senegal Emergent

Ms. Marie Veyrier, Development Director, Global Shea Alliance

Mr. Aaron Adu, Managing Director, Global Shea Alliance

Mr. François Xavier Tetero and Ms. Liliane Mupende, GGGI Rwanda

Moderator

Dr. Gemedo Dalle, GGGI Ethiopia Country Representative

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-climate-smart-agriculture-sustainable-landscape/.

2 Circular Economy and Waste Management: Unlocking potential for Green Job Creation

Agenda

11:00-11:10 Welcome Remarks

(10 mins)

- H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, *Global Green Growth Institute (GGGI)*
- Dr. Jeanne d'Arc Mujawamariya, Minister of Environment (Rwanda)

Moderators: Ms. Michelle DeFreese, Senior Officer GGGI Rwanda, and Adama Hawa Diallo Senior Assistant GGGI Senegal

11:10-11:48

Sub-session A: Circular Economy Business Models

(38 mins)

(Note: primary language is English with simultaneous interpretation provided in French) Waste to Building Materials: Block Solutions Rwanda Experience of Lightweight Construction blocks from recycled plastics

Mr. Eudes Mudenge Kayumba, Landmark LTD

Recycling Wastepaper: A Solution to environmental degradation – the environmental sustainability of paper in Uganda

Mr. Depaul Rukara Mbonigaba, Literacy Action and Development Agency

Panel Discussion: Circular Economy Business Models to Waste: Youth and Womenled Start-ups and Initiatives in Rwanda

- Ms. Flo Mwashimba, Founder, PIMA Zero Waste Store
- Ms. Monica Umwari, Marketing Manager, Angaza Ltd Mr. Noel Nizeyimana, CEO of GreenCare Rwanda Ltd

Q&A

Sub-session B: Waste Management, Policy and Design

11:48-12:28 (38 mins) (Note: primary language is French with simultaneous interpretation provided in English)

Solid Waste Management in Senegal: What is the potential for green job creation Ms. Pod Estelle Ndour & Ms. Aminata Sonko, *Solid Waste Management Unit* La lutte contre le déversement des débris des e-déchets dans les cours d'eau à Abidian 2021

Mr. Gueu Kouapleu Fulgence, *Génération Femmes du Troisième Millénaire (GFM3)*European Circular Economy Action Plan – zoom into waste management policies, biowaste loops, eco-design and packaging

Mr. Stephane Arditi, European Environmental Bureau

<u>Q&A</u>

12:28-12:30

Closing Remarks

(02 mins)

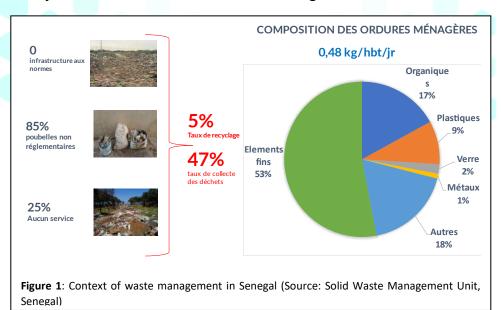
Moderator

Summary

The transition to a circular economy represents a redefinition of growth, from the prevalent linear economic system in which we make, use and then dispose of products and materials to a more sustainable system. Governments around the world are encouraging – and, in some cases, requiring – the adoption of circular economy principles that lead to higher resource efficiency and less waste. A circular economy aims to design out waste and pollution and keep products and materials in use along the value chain through reuse, repair, refurbishment and recycling.

Within the circular economy, green jobs (of which circular economy jobs is a subcategory), emphasize environmental sustainability and social well-being. The adoption of the circular economy in the European Union (EU) has had a positive net effect on job creation with the number of jobs growing by 5% to reach around 4 million. However, in both Africa and Europe, many jobs linked to waste management and recycling are often low-wage and lack consideration for workers' safety despite their frequent exposure to harmful substances. Moreover, in Africa, the majority in such jobs are informal workers with no or limited access to labor and social protection, health coverage, and upskilling opportunities.

Increasingly, African countries are recognizing the opportunities of the circular economy and are reaping the benefits. For example, in the cities of Senegal, with a waste collection rate of 47% and a recycling rate of only 5%,¹⁰ GGGI supported an initiative to pilot waste sorting and recycling, which led to the creation of 7,617 formal jobs to manage waste, and a goal to create a total of 24,000 jobs.¹¹ The context is illustrated on Figure 1.



⁹ European Commission, "Circular Economy Action Plan," March 2020, https://ec.europa.eu/environment/strategy/circular-economy-action-plan en.

¹⁰ Senegal's Solid Waste Management Coordination and Management Unit (UCG).

¹¹ Aminata Sonko, "Gestion des déchets solides au Sénégal: Quel potentiel de creation d'emplois," presentation made at Global Green Growth Week 2021, 25 October 2021.

Some African countries are also active in promoting youth and women entrepreneurship and supporting the creation of sustainable business models to address waste management challenges and drive the circular economy. For example, in Rwanda, the Kigali Farmers' and Artisans' Market works with communities in Kigali and Musanze to collect recyclable materials, and partners with micro-, small- and medium-sized enterprises (MSMEs) who use the recyclable materials in their production cycle. At the same time, Kigali Farmers' and Artisan's Market actively engages with the community, MSMEs and schools to raise awareness about the benefits of a circular economy, encourage practices of reuse and recycling in its zero-waste shop, and offer sustainable solutions to farmers and businesses, such as the planting of seedlings in plastic containers, turning food waste to compost, and using milk cartons for soap molds.

In Africa, the food system has been identified as one of the priorities for applying circularity, particularly waste-to-compost conversion. Other solutions include waste-to-feed (processing food and organic waste to livestock feed), and waste-to-energy (processing food and organic waste into fuels). Besides the food system, other opportunities for increasing circularity in Africa's industries are in plastic waste recycling, textiles recycling, use of mass timber for construction, and electrical and electronic waste (e-waste) recycling.¹²

In Cote d'Ivoire, unregulated e-waste recycling, predominantly by the informal sector, has created jobs, but is associated with workers' exposure to hazardous substances resulting in adverse health effects. The e-waste is also causing serious water pollution in the capital city of Abidjan. Solid waste production is estimated to reach 52 million tons in 2021, with at least 8,000 tons of e-waste. There is therefore an urgent need to improve the regulatory and institutional structure for managing e-waste. At the same time, proper recycling of e-waste requires training and investment in recycling and management technology, to create green jobs with reduced health risks.

Technologies are already available that can turn waste into resources and valuable end products. The key challenges are in raising awareness and creating incentives to shift to circularity, in seeking appropriate solutions that suit the local context, and in developing sustainable business models for circular economy enterprises.

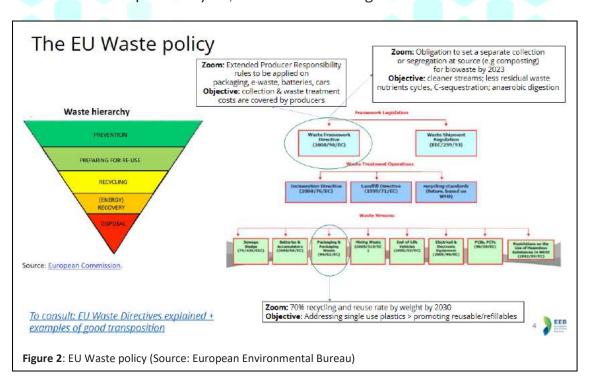
Shifting jobs toward a circular economy requires national policies to incentivize industries and supply chains in adopting circular economy businesses and activities. National policies are also needed to increase investments in waste collection and treatment infrastructure, and ensure standards, including health and safety standards. Support is necessary, particularly for informal MSMEs, and youth and women entrepreneurs in developing businesses in the circular economy, which includes advisory services and skills training, market linkages, strategic partnership development, access to finance, and technology transfer. Furthermore, global collaboration

¹² World Economic Forum, "Five Big Bets for the Circular Economy in Africa," 2021, https://www.weforum.org/reports/fa73a7fa-b353-499a-a6e2-99fc6d00a0d1.

¹³ Vanessa Forti et al., *The Global E-waste Monitor 2020: Quantities, flows and the circular economy potential* (Bonn, Geneva and Rotterdam: United Nations University/United Nations Institute for Training and Research, International Telecommunication Union and International Solid Waste Association, 2020).

across countries and enterprises are important due to the interconnectedness of global supply chains.

In the EU, the main instrument for developing a circular economy is the Circular Economy Action Plan, adopted in 2020. One of its key principles is that waste management must be considered from the start in product design, as the EU estimates that up to 80% of products' environmental impacts are determined at the design phase. The key product value chains targeted are: electronics and information and communications technologies; construction and buildings; packaging; textiles; batteries and vehicles; food, water and nutrients; and plastics. The implementation of the action plan is backed by strong policies, such as the EU Waste Framework Directive (2008/98/EC) that states extended producer responsibility with rules to be applied on packaging, e-waste, batteries and cars, which ensure that collection and waste treatment costs are covered by producers. Producers are also obligated to ensure a 70% recycle and reuse rate by 2030, and set separate collection for biowaste and dry waste to increase their value and recycling opportunities. In addition to the Waste Framework Directive, there are established sector-based waste policies that enable the mobilization of stakeholders to work together to reduce waste and improve waste management. The Sustainable Product Policy Framework promotes the design of sustainable products, builds circularity in the production process, and empower consumers and public buyers, as illustrated on Figure 2.



The European Environmental Bureau is interested in collaborating with countries, including those in Africa at two levels. First, in building the capacity of government authorities and civil society organizations in adapting EU's circularity knowledge and innovations to local contexts. Second, to assess and address the potential impact of EU policies. Although EU policies may lead to positive benefits such as creating a global mass market for less toxic products, and imposing

human rights due diligence requirements for materials import, they could also negatively impact developing economies. Negative impacts could include the illegal shipment of waste causing negative environmental and health impacts in the countries of destination, the export of inefficient products phased out in the EU, and the shipping of recycled materials such as textiles that compete with the national industry at destination.

The circular economy is gaining traction as a model for sustainable green growth. With the COVID-19 crisis forcing countries across the globe to restructure their economies, this is an opportunity to reimagine growth and take action for green transition. Many opportunities have been identified in the circular economy, from new entrepreneurial ventures in recyclables (e.g., in Rwanda), formalizing waste management jobs and improving workers' conditions (e.g., in Senegal) to collaborating on circular global value chains (e.g., in the EU). The circular economy is still nascent and needs to be mainstreamed, which will require a combination of bottom-up entrepreneurial and community-based innovations and top-down leadership in setting a clear pathway for expanding the circular economy and fostering green jobs, youth employment and skills development.

ACKNOWLEDGMENT:

Speakers

Dr. Jeanne d'Aarc Mujawamariya, Minister of Environment, Rwanda

Mr. Eudes Mudenge Kayumba, Landmark LTD

Mr. Depaul Rukara Mbonigaba, Literacy Action and Development Agency

Ms. Flo Mwashimba, Founder, PIMA Zero Waste Store, Rwanda

Ms. Monica Umwari, Marketing Manager, Angaza Ltd

Mr. Noel Nizeyimana, CEO of GreenCare Rwanda Ltd

Ms. Aminata Sonko, Solid Waste Management Unit, UCG Senegal

Mr. Gueu Kouapleu Fulgence, Génération Femmes du Troisième Millénaire

Mr. Stephane Arditi, European Environmental Bureau

Mr. Noel Nizeyimana, CEO of GreenCare Rwanda Ltd

Moderators

Mr. Okechukwu Daniel Ogbonnaya, Country Representative for Rwanda, GGGI

Ms. Michelle DeFreese, Senior Officer GGGI Rwanda

Adama Hawa Diallo, Senior Assistant GGGI Senegal

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-circular-economy-waste-management/.

3 Scaling-up Renewable Energy through Innovation and Blended Finance Solutions

Agenda

9:00-9:03	Special Remarks
(3 minutes)	H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
9:04-9:08	Opening Remarks and Introduction of Speakers
3 minutes)	Moderator: Mahamadou Tounkara, Director of ODG Division, GGGI
9:09-9:45	Presentations (8 minutes per presenter)
46 minutes)	Ms. Natasha Amalie Gjerløv Fiig, Advisor, Danish Energy Agency, Centre for Global Cooperation – 20 years of Danish experiences in variable renewable energy integration and solutions to reach 100% renewable in the power system by 2030
	Mr. Ibsa Melkamu Amenu , Senior Energy Officer, Ethiopia, GGGI Africa Region - GGGI's Renewable Energy work in Ethiopia
	Mr. Shahid Mian (Energise Africa) & Ms. Isona Shibata, (Energise Africa)
	Crowding in people powered finance for an inclusive greeneconomy
	Mr. Eric Mujjona , CEO, Gates and Bytes Limited Uganda – Solar power: Potential to create green jobs and cut emissions in sub-Saharan Africa.
	Mr. Akachukwu Okafor, Principal Partner, Change Partners International Nigeria – Unlocking the bioenergy with carbon capture and storage (BECCS) potential in Nigeria's agricultural sector
	Mr. Mattia Baldini, Danish Energy Agency – Danish sustainable energy growth story: A case study of how an energy utility can transition from fossil fuels to renewable energy and the enabling regulatory framework that made it possible
9:45-10:25	Panel Discussions
30 minutes)	Moderator: Mahamadou Tounkara, Director of ODG Division, GGGI
	Panelists:
	Mr. Akachukwu Okafor, Principal Partner, Change Partners International Nigeria
	Mr. Mattia Baldini, Danish Energy Agency
	Mr. Shahid Mian-(Energise Africa)
	Ms. Isona Shibata (Energise Africa)
	Mr. Ibsa Melkamu Amenu, Senior Energy Officer, Ethiopia, GGGI Africa Region
	Ms. Natasha Amalie Gjerløv Fiig. Advisor, Danish Energy Agency, Centre for Global Cooperation
	Mr. Eric Mujjona, CEO, Gates and Bytes Limited Uganda
10:25-10:30	Closing Remarks
5 minutes)	Moderator: Mahamadou Tounkara, Director of ODG Division, GGGI
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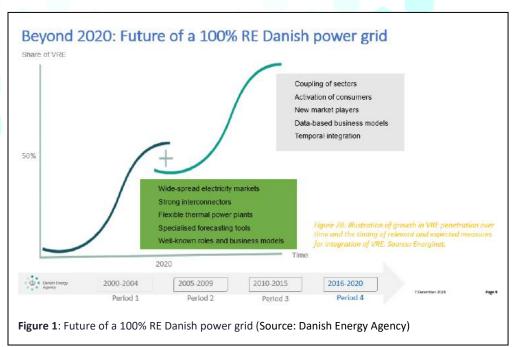
Summary

Energy powers economic growth and social development. Harnessing the potential of renewable energy is a keystone to achieving inclusive green growth, strengthening energy security, and mitigating the impacts of climate change. An exemplary and inspirational example of the transition from a power system based on fossil fuels to renewables is Denmark.

Denmark has the world's highest share of variable renewable energy (VRE) in its power system, with more than half of its electricity demand currently being covered by wind and solar power. This has resulted in a significant reduction in CO₂ emissions from 25 million tons in 1990 to less than 5 million tons in 2020.¹⁴ The achievements have been possible through an evolution of flexibility solutions that enable the power system to cope with variability and uncertainty in both generation and demand. The development of flexibility in Denmark is closely linked to the opening of the electricity market in 2000. ¹⁵ The flexibility is defined as the ability of a power system to cope with variability and uncertainty in both generation and demand, while maintaining a satisfactory level of reliability at a reasonable cost, over different time horizons" (Ma, 2013).

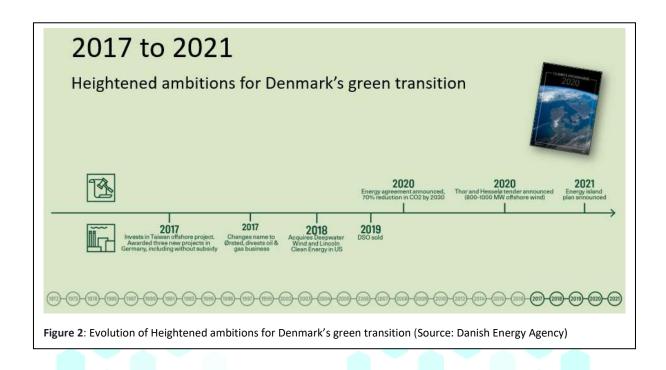
The market design, such as an intra-day market and hourly electricity prices, played a key role in incentivizing investments in the flexibility of power plant operations and across the power sector supply chain to maximize profits under varying electricity prices. Flexibility solutions include use of interconnectors, forecasting and scheduling systems, and technologies that decouple heat and electricity production. In addition, joining the Nordic power exchange, Nord Pool, in 2000 facilitated cross-border trading with neighboring countries, providing an important source of flexibility. These flexibility solutions have enabled Denmark to increase its VRE from 12% in 2000 to over 50% today. Looking forward, to enable 100% renewable Danish power system by 2030, existing solutions will not be able to meet future demand of flexibility Figure 1). The focus is therefore shifting toward increased sector coupling and

demand-side flexibility through new technologies, innovative use of existing technologies, digitalization and datadriven business models. Figure 2 highlights the Denmark heightened ambitions for green transition.



¹⁴ Baldini, Mattia. Danish Energy Agency

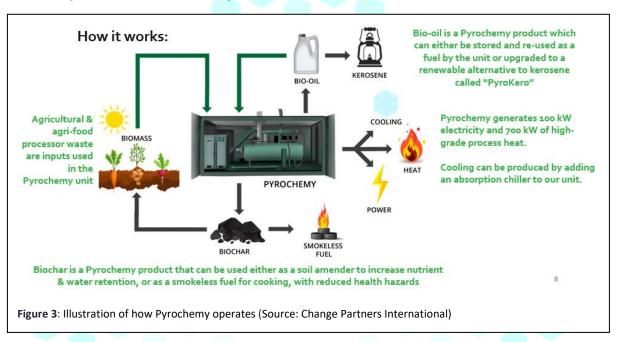
¹⁵ Amalie Gjerløv Fiig, Natasha. Danish Energy Agency



The case of Denmark provides a number of learnings and good practices for other countries in scaling-up renewable energy. Strong policies and regulations are important and some of the key instruments that have led to Denmark's success include: economic incentives such as subsidies and taxes; competition-based reforms of the electricity sector; demonstration projects and test facilities through public-private partnerships and joint ventures; and de-risking and reforms to permitting procedures, such as the establishment of the Danish Energy Agency as a one-stop shop authority for investors in renewable energy projects. Other good practices involve the constant and consistent engagement and education of stakeholders throughout the process, including in devising an exit strategy for fossil fuels and an entry strategy for renewable energy. Human capacity building is also critical, focusing on retraining existing personnel and creating new talents simultaneously.

To support member countries address energy challenges and expand the renewable energy generation mix, GGGI implements both on-grid and off-grid renewable energy projects that contribute to greenhouse gas emissions reduction, creation of green jobs, increased access to green and affordable energy, and improved air quality. For example, in Ethiopia, GGGI is supporting the government in catalyzing investment in solar energy supply at Adama Industrial Park, as part of the country's effort to develop sustainable and zero emission industrial parks. GGGI is also strengthening capacities in the deployment of solar-powered irrigation systems in both Ethiopia and Senegal and has mobilized US\$50 million for the scale-up of solar-powered irrigation systems in Senegal. Also in Senegal, GGGI has been promoting waste-to-energy solutions and has supported the government in developing a waste-to-energy roadmap, particularly to promote energy production from industrial biogas sources.

Another example of waste-to-energy solution is being piloted in Nigeria, which makes use of the country's agricultural biomass potential. According to a research study, Nigeria's agricultural residues from cassava, maize, oil palm, plantain, rice and sorghum, have an energy potential of almost 303,000GWh, which is more than 10 times Nigeria's current electricity installed capacity. The solution being explored is a proprietary Pyrochemy technology developed by PyroGenesys UK Limited. Pyrochemy is a proven solution that transforms agricultural residues into renewable electricity, high-grade low-carbon process heat and cooling, biofuel and biochar (Figure 3). The solution of the country's agricultural residues into renewable electricity, high-grade low-carbon process heat and cooling, biofuel and biochar (Figure 3).



For such innovative solutions, as well as for a new generation of African solar entrepreneurs, access to financing to grow and scale their ideas and businesses remains a major challenge. Blended finance that combines the power of development finance and private capital to reduce risks and increase opportunities for private investors could mobilize the investments needed to accelerate renewable energy uptake and upscaling. In addition to development finance institutions, donor agencies, international philanthropies and governments, crowdfunding platforms are rolling out blended finance solutions to rapidly scale climate finance, especially for emerging markets and small-scale businesses.

One such crowdfunding platform is UK-based Energise Africa that is leveraging the untapped potential of retail investors as a source of private capital to close the climate financing gap. Energise Africa works with strategic partners such as UK Aid, P4G and Good Energies Foundation to provide innovative blended financial products that enable solar businesses in Africa to grow and scale. To date, Energise Africa has passed £25 million in people-powered finance, enabling 655,000 to have access to solar power in Africa, and an estimated 140,000 tons of annual CO₂ emissions mitigated. Strategies that have contributed to their success include de-risking investments by establishing ring-fenced cash reserve, and building

¹⁶ Okafor, Akachukwu. Change Partners International

¹⁷ Biochar is a Pyrochemy product that can be used either as a soil amender to increase nutrients and water retention, or as a smokeless fuel for cooking, with reduced health hazards.

¹⁸ Shibata, Isona & Mian, Shahid. Energise Africa

confidence of crowd investors through match funding by reputable organizations like UK Aid. However, Energise Africa recognizes that there continue to be barriers for small- and medium-sized enterprises (SMEs) in emerging markets to access finance. For instance, finance raised on Energise Africa is in British pounds, but most emerging market SMEs have spending and revenue streams in USD or local currencies, which place foreign exchange risk on the borrowers and introduce friction and additional transaction costs. Energise Africa are innovating to address these barriers for greater inclusivity. New blended financial products are planned such as local currency bonds and hedged USD products that shield investors and investees from foreign exchange risk.

Toward green COVID-19 recovery and a green transition to renewable energy, improving access to climate finance, human and institutional capacity building, research and development, and enabling policy frameworks are key ingredients. Innovative financial mechanisms include those that blend financial instruments, reduce specific risk investments, and leverage private capital to accelerate renewable energy uptake and upscaling. An essential aspect in attracting private sector engagement and investment is greater transparency and more open communication, allowing investors to better assess and reduce risks. Continued innovation to match the right types of financial instruments to specific projects goals and objectives, along with aggregation and bundling of projects that can attract large-scale investors will also be needed.

ACKNOWLEDGEMENT

Speakers:

- Ms. Natasha Amalie Gjerløv Fiig, Advisor, Danish Energy Agency
- Mr. Mattia Baldini, Advisor, Danish Energy Agency
- Mr. Ibsa Melkamu Amenu, Senior Energy Officer, GGGI Ethiopia
- Mr. Shahid Mian, Product Innovation Manager, Energise Africa
- Ms. Isona Shibata, Programme Manager, Energise Africa
- Mr. Eric Mujjona, Chief Executive Officer, Gates and Bytes Limited, Uganda
- Mr. Akachukwu Okafor, Principal Partner, Change Partners International, Nigeria

Moderator:

Mr. Mahamadou Tounkara, Director of ODG Division, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-renewable-energy-energy-efficiency/.

4 Climate Smart Agriculture: Unlocking the potential of Innovation and Climate Risk Insurance for Smallholder farmers in Africa

Agenda

08:00-08:15 Welcome Remarks and Introduction to GGGI

(15 minutes) H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green

Growth Institute (GGGI)

Opening remarks

Chair: Dr. Harold Roy-Macauley, Director-General, Africa Rice

08:15-09:10 Presentations

(55 minutes) Moderator: Mr. Linus Mofor, Expert on Energy and Climate, UNECA

Presenters:

Dr. Omar Diouf, GGGI Africa Lead Climate-Smart Agriculture & Energy Nexus -

GGGI's work on CSA in Africa

Mr. Shiferaw Tafesse Gobena, GGGI Senior Program Officer, Sustainable Land Use and Agriculture Program - *Promoting Solar Powered Irrigation Pumps for Climate*-

Smart Agriculture in Ethiopia: Challenges and Opportunities

Ms. Jacobeth Barno, Regional Manager Anglophone, PULA Advisors - *Powering*

smallholder farmers against climate risk by providing insurance

Mr. Alfred Ntibahakada Bahungu, Kigoma Disable Survival Group - *Food security and climate change*

Mr. Aliou Babou, General Manager of EDEC Company - Risk Zero Package of

Conservation Agriculture for Smallholders in Senegal

Mr. Tom Bosschaert, Director, Except Integrated Sustainability - Sustainable agriculture in arid climate regions: Bringing food to the desert

09:10-09:55 **High-Level Panel**

(45 minutes) Moderator: Mr. Linus Mofor, Expert on Energy and Climate, UNECA

Panelists:

Ex. Mr. Salifou Ouedraogo, Ministre de l'Agriculture, Aménagements Hydroagricoles

et de la Mécanisation, Minister of Agriculture, Burkina Faso

Hon. Mr. Frank Tumwebaze, Minister of Agriculture, Animal Industry and Fisheries, Uganda

Dr. Robert B. Zougmoré, Africa Program Leader, CCAFS, ICRISAT, West and Central

Africa Office, Bamako Mali

Mr Malick Ndiaye, Director General, La Banque Agricole du Senegal

Q&A

09:55-10:00 Closing

(5 minutes) Chair: Dr. Harold Roy-Macauley, Director-General, Africa Rice

Summary

In Africa, more than 60% of the population depends on agriculture for their livelihood, and the agriculture sector contributes to over 30% of the continent's gross domestic product.¹⁹ With climate change reducing crop yields and lowering livestock productivity, a shift in approach is required to sustain livelihood and meet rising demands for food.

Climate smart agriculture (CSA) is an approach for transforming and reorienting agricultural systems to support food security under the dynamic realities of climate change.²⁰ CSA has three essential features: (1) the integration of climate change into the planning and development of sustainable agricultural systems; (2) the identification of synergies and negotiation of trade-offs in pursuit of three key outcomes – increased productivity, enhanced resilience (adaption) and reduced emissions (mitigation); and (3) the availability of new funding opportunities for adaptation and mitigation.

However, there are significant barriers in adopting, mainstreaming and scaling CSA, which can be divided into three main aspects – technical, political and financial. Technical barriers include the capacity of agriculture stakeholders, including governments, financial institutions, researchers, agricultural extension service providers and farmers, in designing and developing CSA initiatives, leveraging the right source of financing for these initiatives, and then managing and monitoring the initiatives. Political barriers are related to weak governance and legal frameworks that limit access to CSA technologies and financing. For example, in Ethiopia, the government is supporting the transition from diesel-powered to solar-powered irrigation pumps by making imports of solar pumps tax free. However, despite the tax abatement, the initial cost of solar pumps is still slightly higher compared to conventional diesel pumps, and the process for customs clearance is very lengthy. Moreover, the lack of formal property rights for land limits the ability of farmers to provide collateral, thereby limiting their access to finance. Financial barriers include the mismatch between farmers' financial needs and the financial services available in the market, including repayment schedules that are not aligned with production cycles. Moreover, agricultural assets are typically too small to attract large-scale investors, resulting in limited capital available.

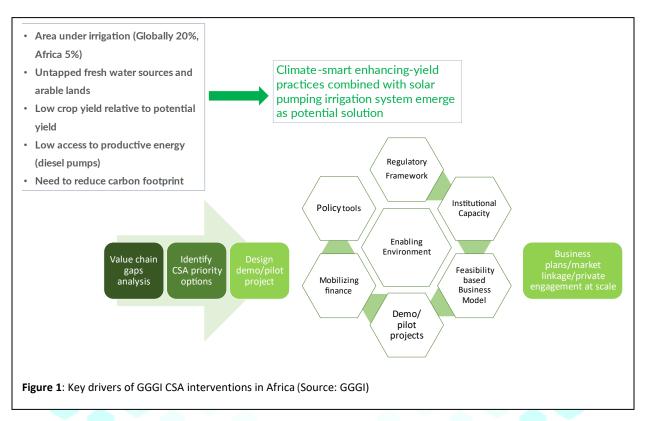
GGGI is holistically addressing these barriers to CSA adoption and has been supporting governments in identifying viable CSA options and enabling their effective delivery and scaling (Figure 1). In Africa, GGGI is implementing seven CSA projects in five countries – Burkina Faso, Ethiopia, Mozambique, Senegal and Uganda – with US\$140 mobilized. GGGI uses an agricultural value chain approach to CSA, and the process starts with conducting value chain gaps analyses to identify CSA priority options and design demonstration projects. Through this process, GGGI has identified the potential for combining solar-powered irrigation systems with CSA for strengthening farmers' resilience to climate change impacts. For example in Mozambique, GGGI worked with farmers to design solar-powered irrigation systems that suit their needs, requirements and budget, and at the same time reduce greenhouse gas emissions. In Senegal, GGGI has a project to promote solar irrigation for rice production in river valleys to reduce rice farming dependence on fossil fuels for irrigation and improve the livelihood of rice farmers. Currently, feasibility studies and capacity building of farmers in CSA practices are ongoing. The expected results of the project include the switching of 20 pumping stations in Senegal river valley from fossil fuel-powered irrigation

¹⁹ Diouf, Omar. GGGI. "GGGI's Work on CSA in Africa," presentation made at Global Green Growth Week 2021, 26 October 2021.

²⁰ Definition adapted from: Leslie Lipper et al., "Climate-smart agriculture for food security," Nature Climate Change, vol. 4 (November 2014), https://www.nature.com/articles/nclimate2437.

²¹ Tafesse Gobena, Shiferaw. GGGI

pumps to solar powered ones, introduction of CSA practices on over 1,800 hectares of rice fields, and mobilization of US\$50 million for scaling solar irrigation and CSA in the river valley. The financial, employment and climate benefits from this pilot will be documented to enable wider adoption and scaling of CSA technologies and practices.



Projects and studies have found that CSA is not a set of practices that can be universally applied – it is context specific and must be data driven. Therefore, it is important that tools are available to help users select the most appropriate technologies that suit their context. Research and deployment must be inclusive and participatory and consider the needs of different agriculture stakeholders. The CGIAR Research Program on Climate Change, Agriculture and Food Security has developed a climate smart village approach that is holistic and participatory and engages multiple stakeholders to match the needs of communities with promising CSA technologies and practices. CSA technologies are not limited to modern, advanced digital technologies – they include indigenous technologies that are existing in the communities but deployed in ways that meet the three key outcomes of CSA – productivity, adaptation and mitigation.

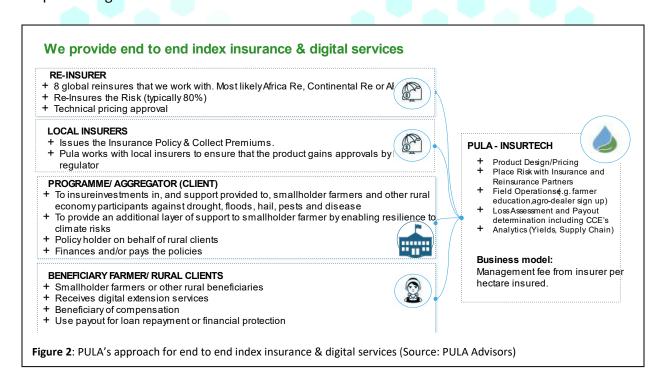
Other effective approaches include systems thinking and stakeholder collaboration used by EXCEPT Integrated Sustainability, an organization based in the Netherlands, to innovate in CSA for arid regions and develop sustainable solutions to water shortage and food security challenges.²² One of these solutions is called "Serenity Farm" that combines existing technologies and systems in new ways to create a sustainable greenhouse facility for profitable food production in arid climates. The first site will be in Saudi Arabia – the only water it uses will be salt water sourced from the Red Sea, and the facility will be powered

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²² Bosschaert, Tom. EXCEPT Integrated Sustainability

entirely by solar energy. Serenity Farm will focus on local production of high-quality fresh produce that reduces water use and carbon emissions, and at the same time create long-term jobs. Embedded in Serenity Farm are high-tech research and development centers, and education and training centers for continued systems improvement and capacity building. Currently, EXCEPT Integrated Sustainability is adapting this model to the Ethiopian context for smallholder farmers.

Innovative climate smart insurance products are contributing to CSA adoption and enhancing farmers' adaptive capacity. Traditionally, insurance fails to provide value with limited coverage and many exclusions. Moreover, claims processing is often too complex and compensation payments are delayed. PULA is an agricultural insurance and technology company that addresses these challenges by designing and delivering index insurance products and digital services that meet smallholder farmers' needs.²³ One of the services that PULA offers is area yield-based index insurance where coverage is based on yield performance rather than risk parameters such as drought and flood (Figure 2). Leveraging digital technologies such as big data analytics and machine learning, PULA designs index insurance products that are both comprehensive in coverage and affordable. PULA also leverages digital technologies to ensure timely processing of claims and compensation payments. An innovative approach that PULA has taken is the bundling of insurance with CSA technologies and practices, which creates a win-win situation that makes insurance more attractive to farmers and at the same time promotes adoption of CSA. Another example of innovative bundling of insurance with CSA technologies and practices is EDEC Senegal's Risk Zero Package of Conservation Agriculture for smallholder farmers that combines direct seeding mechanization services, certified seeds, low dose of mineral fertilizers and organic manure, and subscription to agricultural insurance.²⁴



²³ Barno, Jacobeth. PULA Advisors

²⁴ Babou, Aliou. EDEC-Senegal

CSA is unlocking innovations, and urgent actions are needed to mainstream CSA to transform Africa's agriculture sector into a more productive, climate-resilient and low-emissions sector. Key recommendations for CSA adoption, mainstreaming and upscaling include: (1) better coordination and collaboration among development organizations to promote CSA widely across the African continent; (2) awareness creation and capacity development not only among farmers but also among governments, financial institutions, agricultural extension workers, researchers and agricultural experts; (3) creating an enabling environment for CSA and integrating CSA in national climate policies and budgets; and (4) increased access to finance and insurance for importers and farmers to deploy CSA technologies.

ACKNOWLEDGEMENTS:

Speakers:

- Dr. Omar Diouf, Regional Lead Africa for Climate Smart Agriculture and Energy Nexus, GGGI
- Mr. Shiferaw Tafesse Gobena, Senior Program Officer, Sustainable Land Use and Agriculture Program, GGGI
- Ms. Jacobeth Barno, Regional Manager Africa Anglophone, Pula Advisors
- Mr. Aliou Babou, General Manager, EDEC Senegal
- Mr. Tom Bosschaert, Director, EXCEPT Integrated Sustainability
- Dr. Robert Zougmoré, Africa Program Leader, Climate Change, Agriculture and Food Security, International Crops Research Institute for the Semi-Arid Tropics
- Mr. Vamsi Duraibabu, Regional Investment Lead Africa, GGGI

Chair and Moderator:

- Dr. Harold Roy-Macauley, Director-General, Africa Rice
- Mr. Linus Mofor, Expert on Energy and Climate, United Nations Economic Commission for Africa

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-climate-smart-agriculture-sustainable-landscape/.

5 Innovations and Green Entrepreneurship in Africa: Unlocking the potential for Green Job Creation and Green Recovery

Agenda

11:00-11:10 Welcome Remarks

(10 minutes)

- Mr. Ban Ki-moon, President & Chair, Global Green Growth Institute (GGGI)
- Hon. Rosemary Mbabazi, Minister of Youth and Culture (Rwanda) -

Brief introduction of the sessions

Moderators: Okechukwu Daniel Ogbonnaya, Country Representative GGGI Rwanda, and Ineza Grace Umuhoza, Founder/CEO, The Green Protector

11:10-12:10 Sub-session A: Greenpreneurs and Youth Employment

(60 minutes)

(Moderator: Okechukwu Daniel Ogbonnaya)

(Note: primary language is English with simultaneous interpretation provided in French)

Rwanda Youth Employment Initiatives – Featuring the Greenpreneurs Project and Government's ECO BRIGADE Initiative

Pamela Birungi (GGGI)

Green Employability skill in Ethiopia: The Case of ADRA Green Energy TVET project

Mr. Darge Adenew Degefa, ADRA

Green innovation in an era of disruption: Green skills for green growth in sub-Saharan Africa post COVID-19

Ms. Olivia Muza, STEAM Women

Green Energy Advantage and Opportunity for Youth in Ethiopia

Mr. Abayneh Mekonnen, Adama Polytechnic College

Q&A

12:10-13:00

Sub-session B: Green and Resilient Recovery through Entrepreneurship (Moderator: Ineza Grace Umuhoza)

(50 minutes)

(Note: primary language is French with simultaneous interpretation provided in English)

Eco-bricks to promote environmental sustainability in rural sanitation

Ms. Joséphine B.L TINE, ART-PESOUNG

Entrepreneurship for Resilience and Recovery

Mr. Arab Hoballah, SEED

Capacity Building for Green Jobs, Green Growth, and Net Zero 2050

Dr. Rajae Chafil, Director General of the Climate Change Competencies Center (4C Morocco)

Q&A

Closing and Recap of Session Takeaways

Moderator

Summary

Many African countries have adopted inclusive and green national development strategies that prioritize youth involvement in the transition to a green economy. For instance, Rwanda's comprehensive and inclusive National Strategy for Transformation 2018-2024 prioritizes sustainable management of the environment and natural resources, among other priorities, and places youth at the center of developing a green economy. Youth entrepreneurship is critical to Africa's transformation and green recovery as countries emerge out of the COVID-19 crisis.

In alignment with its National Strategy for Transformation, the Government of Rwanda's Youth Ecobrigade Program has been promoting green entrepreneurship among youth since 2019. This five-year program has four main interventions: (1) engagement of youth in the building of radical terraces and progressive terraces; (2) youth involvement in afforestation and protection of river buffer zones; (3) training of youth in financial literacy and creating a culture of saving; and (4) promotion of green jobs and green entrepreneurship among youth. The program has resulted in the employment of over 9,000 youth in three rural districts and provided seed capital to help youth cooperatives jumpstart their promising green entrepreneurial initiatives. The government is planning to scale this successful program nationwide with the aim to create green jobs for 50,000 young people over the next three years.²⁵

Building on the success of the Youth Ecobrigade Program, GGGI in collaboration with Youth Connekt Africa Hub and Fund, Ministry of Youth and Culture, and National Youth Council established the Rwanda Greenpreneurs Network. The network coordinates the different entities that are working to support youth and women greenpreneurs, including accelerators, co-working spaces, incubators, innovation hubs, startup support labs, research centers, mentors and investors, and serves as a one-stop center for greenpreneurs to access the financial and technical and resources required for designing and developing sustainable green businesses. The network plans to support the acceleration of green ventures and scale up innovative solutions to environmental issues.

Another initiative supporting youth and women greenpreneurs is Morocco's Climate Change Competencies Center (4C Morocco), which offers a platform for dialogue and capacity building of stakeholders and a hub for information on climate change in Morocco and Africa. ²⁶ It includes masterclasses for youth and training for teachers on different aspects of climate change, and the exchange of experience and knowledge on solutions to the climate crisis.

²⁵ Keynote speech by Hon. Rosemary Mbabazi, Minister of Youth and Culture, Rwanda at Global Green Growth Week 2021, 26 October 2021.

²⁶ Chafil, Rajae. Climate Change Competencies Center (4C Morocco)

In Ethiopia, technical and vocational education and training (TVET) institutions have been integrating green vocational training with support from organizations such as the Adventist Development and Relief Agency (ADRA).²⁷ The Adama Polytechnic College, for example, has established training centers for solar system technicians. The project being implemented by ADRA is targeting to train 2,200 youth on green energy occupations, such as on solar photovoltaic system installation, operation and maintenance, to simultaneously address youth unemployment and renewable energy uptake. The project also aims to create an enabling ecosystem and framework for TVET renewable energy education, with occupational standards, curriculum design, teaching and learning materials, and the integration of renewable energy occupational skills development into national TVET policy and strategy.²⁸

The COVID-19 pandemic has been a wake-up call for African countries on the urgency to upskill and reskill the labor force in order to boost resilience and better cope with future crises and threats. STEAM Women, an organization that supports youth and women in technological skills development, found that the pandemic has resulted in a shift in the skills required by farmers – from farm management to agricultural value chain management, and door-to-door selling and people skills to online selling and data analytics.²⁹ Green skills development and green entrepreneurship must take these rapidly changing skills needs into consideration, particularly in improving digital literacy and skills, and leveraging the potential of digital technologies in developing innovative climate solutions.

Similarly, SEED, an organization that supports social and environmental entrepreneurship, found that entrepreneurship, upskilling and reskilling, and digital development are particularly crucial for post-COVID-19 green recovery response. A survey conducted by SEED involving 36 eco-inclusive enterprises and 15 ecosystem support organizations on their contributions to green recovery showed that almost 90% of the enterprises invested in research and development and digitalization. Moreover, over half of the enterprises created new jobs, and contributed to organic agriculture and energy savings, and about 40% contributed to emissions savings and forest protection.³⁰

Some examples of award-winning enterprises recognized by SEED and contributing to green recovery include Malawi's Green Impact Technologies that is providing affordable renewable energy to unelectrified communities. During the pandemic they expanded their target market to provide clean energy to local health services, and digitalized their business activities to comply with movement restrictions. Ghana's Farmerline empowers local farmers through a mobile platform that provides agricultural information and financial services. During the pandemic, the platform was also used to deliver trusted information about COVID-19 to farmers across the country. Another innovative green enterprise is ART-PESOUNG based in Senegal that builds and sells ecological and affordable toilets using locally-sourced materials to create compressed earth bricks, coupled with an emptying service for environmental safety and the circular economy.

Green entrepreneurial growth lies at the heart of countries' green recovery and transition to a green economy, with the potential to create innovative solutions and accelerate the creation of green jobs. However, upskilling and reskilling are urgently required, particularly in boosting young people's digital

²⁷ Adenew Degefa, Darge. ADRA

²⁸ Mekonnen, Abayneh. Adama Polytechnic College

²⁹ Muza, Olivia. STEAM Women

³⁰ Hoballah, Arab. SEED. "Innovations and Green Entrepreneurship in Africa: Unlocking the Potential for Green Job Creation and Green Recovery," presentation made at Global Green Growth Week 2021, 26 October 2021.

literacy and skills as products and services move online. Governments, development organizations, education and TVET institutions, research institutions, and the private sector must collaborate in supporting an ecosystem for youth and women entrepreneurship through initiatives such as GGGI's Greenpreneurs Network, SEED and Climate Change Competencies Center – giving priority to infrastructure building, capacity strengthening, policies and regulations that enable green entrepreneurship, and increasing entrepreneurs' access to financial resources and technical know-hows.

ACKNOWLEDGMENT

Speakers:

- Hon. Rosemary Mbabazi, Minister of Youth and Culture, Rwanda
- Ms. Pamela Birungi, Senior Communications and Knowledge Management Officer for Rwanda, GGGI
- Mr. Darge Adenew Degefa, Monitoring, Evaluation, Accountability and Learning Officer, Adventist Development and Relief Agency, Ethiopia
- Mr. Abayneh Mekonnen, Private Sector Partnership and Engagement Expert, Adama Polytechnic College, Ethiopia
- Ms. Olivia Muza, Co-founder and Interim Chief Executive Officer, STEAM Women
- Ms. Joséphine B.L. Tine, Founder and Chief Executive Officer, ART-PESOUNG, Senegal
- Mr. Arab Hoballah, Executive Director, SEED
- Dr. Rajae Chafil, Director General, Climate Change Competencies Center, Morocco

Moderators:

- Mr. Okechukwu Daniel Ogbonnaya, Country Representative for Rwanda, GGGI
- Ms. Ineza Grace Umuhoza, Founder and Chief Executive Officer, Green Protector

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-entrepreneurship-green-jobs-green-recovery/.

6 Enhancing Countries' Direct Access to Climate Finance (Africa and the Middle East)

Agenda

10:00-10:05 **Welcome Remarks** (5 minutes) H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Mr. Pa Ousman Jarju, Director (Country Programming), Green Climate Fund (GCF) 10:05-11:05 **Country Presentations** 1. Burkina Faso NDA: Prime Ministry Speaker: Mr. Issaka Ouedraogo, Adviser to the Prime Minister/Environment Inspector 2. Cote d'Ivoire NDA: Minister's Office, Ministry of Environment and Sustainable **Development** Speaker: Mr. Marcel Yao, Public Policy, Climate Change and Ecological Transition Expert / Technical Advisor to the Minister in charge of International Cooperation and Resource Mobilization 3. Ethiopia NDA: Environment, Forest and Climate Change Commission Speaker: Mr. Habtamu Denboba, Senior Resource Mobilization and M&E specialist/Alternate NDA for GCF 4. Jordan DAE: Cities and Villages Development Bank Speaker: Mrs. Wafa Abu Samra, Accreditation Focal Point 6. Rwanda NDA: Rwanda Environment Management Authority Speaker: Mrs. Juliet Kabera, Director General Open Discussion/Q&A 11:05-11:15 (10 minutes) Facilitator: GCF/GGGI 11:15-11:20 **Closing Remarks** (5 minutes) Mr. Mahamadou Tounkara, Director (Office of the Director General), GGGI

Summary

Direct access to the Green Climate Fund (GCF) is a key modality through which developing countries can mobilize finance for their climate priorities. GGGI and GCF have established a strong track record of collaboration in using the GCF Readiness Programme to enhance the capacity of developing countries in accessing climate finance resources. Countries that GGGI and GCF have been supporting in Africa and the Middle East include Burkina Faso, Côte d'Ivoire, Ethiopia, Jordan and Rwanda.

Generally, through the Readiness Programme, GGGI has focused on supporting countries in the accreditation process, mobilizing the private sector for climate actions, and strengthening the capacity of the national designated authorities (NDAs), direct access entities (DAEs), and other climate stakeholders from government, the private sector and civil society in identifying, designing and managing climate projects.

In Burkina Faso, the successful selection of a private sector entity for accreditation – the Coris Bank International – in addition to the government-established Environmental Interventions Fund, was due to strong leadership at the Prime Ministry (NDA) and the development of clear selection criteria, as well as strong commitment of all stakeholders from the start of the process. Four GCF concept notes were prepared in consultation with multiple stakeholders, contributing to country ownership. Moreover, the leveraging of online tools contributed to successful engagement and training with stakeholders. An online survey conducted among public and private institutions involved in climate actions helped to better assess training needs and design the training sessions, and the webinars to introduce the concept and framework for climate financing enabled broader participation among private sector institutions.

In Côte d'Ivoire, a series of assessments conducted helped to identify entities for accreditation and better understand private sector's barriers to climate finance. Subsequently, a private sector platform on climate finance opportunities was launched in October 2020, and three GCF concept notes were prepared. The key lessons and practices that contributed to success include the involvement of senior officials of the DAE from the start at the assessment and gap analysis process, which facilitated timely access to information. The establishment of a platform to enable early engagement with multiple stakeholders in the project identification, conceptualization and development processes was also essential. The rapid adoption of digital technologies for regular communication enabled continued progress and stakeholder engagement despite movement restrictions during the COVID-19 pandemic.³²

In Ethiopia, GGGI and GCF is enhancing the institutional capacity of Ethiopia's DAE – the Ministry of Finance – to access climate finance and upgrade its accreditation status to manage medium-sized projects, as well as increase private sector engagement in climate financing. A key lesson learned is the importance of a national strategy and plan for climate action that helped the Environment, Forest and Climate Change Commission (NDA) better coordinate and prioritize projects for climate financing. A GCF concept note write-up workshop was organized to support the drafting of seven concept notes and three were prioritized for submission to GCF. In addition to the organization of workshops, mechanisms to regularly engage stakeholders and promote networking and partnerships in national climate programming was crucial. A series of capacity building workshops was also organized and the development of training materials in advance contributed to their effectiveness.³³

Rwanda is supported by five Readiness Programmes between 2016 and 2021. They focus not only on building national-level capacity, but also subnational-level capacity, especially in secondary cities, to design climate projects and formulate GCF concept notes and proposals that are aligned with green cities' master plans. They also focus on building national and subnational governments' capacity to better engage and coordinate with multiple stakeholders, including the private sector, in climate programming and financing. In Rwanda, the emphasis on subnational-level capacity building has been instrumental in the

³¹ Ouedraogo, Issaka. NDA, Prime Minister Office, Burkina Faso

³² Yao, Marcel. Ministry of Environment & Sustainable Development, Cote d'Ivoire.

³³ Denboba, Habtamu. Environment Forest and Climate Change Commission, Ethiopia

successful development of pipeline projects. Technical studies to reduce flood and landslide risks are being conducted in five selected cities for development of climate financing strategies and bankable projects. In addition, support is being provided to the Rwanda Environment Management Authority (NDA) and Ministry of Environment (DAE) in the accreditation renewal process to enable the private sector to access climate finance more easily.³⁴

In Jordan, GGGI and GCF supported the Ministry of Environment (NDA) in selecting a DAE – the Cities and Villages Development Bank (CVDB) – through an open and transparent process, and in developing eight GCF concept notes. The accreditation process, although complex, has been an opportunity for CVDB to develop their institutional capacity. In advance of GCF accreditation, CVDB's assets are being used to implement energy efficiency projects across the country as a result of a European Investment Bank loan program. Projects will include solar parks, electric vehicle charging infrastructure and LED streetlighting. To increase private sector engagement, CVDB has updated its bylaws to offer services to the private sector. CVDB also plans to sign a Memorandum of Understanding with the Ministry of Environment to support the implementation of the National Green Growth Plan. ³⁵

The insights from the different countries show that there is no one way to approach direct access for Africa's green transition and is dependent on the national context. However, common across the countries, a strong national climate financing policy and strategy framework has been key in promoting stakeholder commitment, as well as strengthening coordination and cooperation horizontally across sectors and vertically from national to the local levels. Many countries have also established structures and mechanisms to facilitate multistakeholder coordination and cooperation in planning and developing climate projects.

ACKNOWLEDGMENT

Speakers:

- Mr. Pa Ousman Jarju, Director of Country Programming Division, GCF
- Mr. Issaka Ouedraogo, Adviser to the Prime Minister and Environment Inspector, Burkina Faso
- Mr. Marcel Yao, Public Policy, Climate Change and Ecological Transition Expert / Technical Advisor to the Minister in Charge of International Cooperation and Resource Mobilization, Cote d'Ivoire
- Mr. Habtamu Denboba, Senior Resource Mobilization and M&E Specialist / Alternate NDA for GCF, Environment, Forest and Climate Change Commission, Ethiopia
- Mrs. Wafa Abu Samra, Head of International Project Division, Cities and Villages Development Bank, Jordan
- Mrs. Juliet Kabera, Director General, Rwanda Environment Management Authority, Rwanda
- Mr. Mahamadou Tounkara, Director of Office of the Director General Division, GGGI

Moderator:

• Julie Robles, Manager for Partnership and GCF Portfolio, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.

³⁴ Kabera, Juliet. Rwanda Environment Management Authority

³⁵ Abu Samra, Wafa. Cities and Villages Development Bank, Jordan

7 Unlocking the potential of Climate Finance & Carbon Pricing in Africa

♣ Agenda

09:30-09:35 (5 minutes)	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Introduction to GGGI and Carbon Pricing thematic Ms. Fenella Aouane, Deputy Director and Head of Carbon Pricing Unit, Global Green Growth Institute (GGGI)					
09:35-09:45 (10 minutes)	GGGI's work on Carbon pricing in Morocco & Senegal Mr. Nacif Safouane, Senior Program Officer, Designing Article 6 Policy Approaches - Carbon Pricing Unit- GGGI					
09:45-09:55 (10 minutes)	Climate & Carbon Finance for Nature-Based Solutions in Africa - Challenges and Opportunities Mr. Ludwig Liagre, International climate finance expert - Rioimpact-Luxembourg					
09:55-10:05 (10 minutes)	The Preferential Treatment of Green Bonds Mr. Matthias Kaldorf, Phd Student- Center for Macroeconomic Research university of cologne- Germany					
10:05-10:55 (50 minutes)	Panel Discussion: Unlocking the potential of Climate Finance & Carbon Pricing in Africa)					
	Moderator: Ms. Ximena Aristizabal , Global Coordinator DAPA Program, Global Green Growth Institute (GGGI)					
	Mr. Abdelghani Boucham, Head of Climate Change, Department of Sustainable Development-Ministry of Energy Transition and Sustainable Development Ms. Malin Meyer, Advisor, Royal Norwegian Ministry of Climate and Environment (NMCE) Mr. Mischa Classen, Director of Carbon Procurement, Klik Swiss Foundation Mr. Andrei Marcu, Executive Director, Roundtable on Climate Change and Sustainable Transition (EDCST)					
10:55-11:00 (5 minutes)	Transition (ERCST) Closing remarks Fenella Aouane, Deputy Director and Head of Carbon Pricing Unit, Global Green Growth Institute (GGGI)					

Summary

Africa requires about US\$4 trillion for mitigation and US\$488 billion for adaptation by 2030 to implement its Nationally Determined Contributions (NDCs), according to the Carbon Pricing Leadership Coalition.³⁶ Mobilizing climate finance for Africa can only be achieved with the diversification of innovative mechanisms and instruments, including those provided under Article 6 of the Paris Agreement on international cooperation approaches for channeling both climate and carbon finance.

Climate finance aims at reducing emissions and enhancing sinks of greenhouse gases, as well as reducing vulnerability and enhancing resilience of human and ecological systems to negative climate change impacts. Carbon finance is a branch of environmental finance typically referring to the revenue streams generated by sale of greenhouse gas emission reductions either in the form of credits or emission permits.

Worldwide, carbon markets play a vital role in financing climate action. Amid the backdrop of COVID-19 impacts and economic recoveries, growing attention is being paid in utilizing carbon markets to reach climate goals, especially given the enormous potential that African countries have in emission reductions that can be put on sale in the framework of the international carbon market. This potential is estimated at 1.5Gt CO₂ by 2030, which could generate an additional US\$29 billion that could be reinvested to increase the ambition and accelerate the implementation of NDCs.³⁷

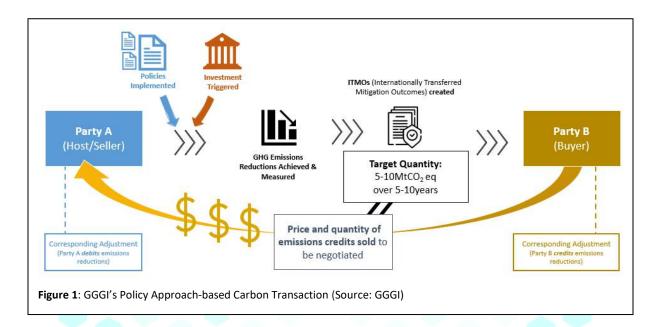
GGGI is supporting countries in unlocking international carbon finance, and is a leading actor in piloting international carbon transactions under Article 6 that provides for international trading of emissions reduction through the Internationally Transferred Mitigation Outcomes mechanism.³⁸ GGGI is implementing two programs – (1) Designing Policy Approaches under Article 6 (DAPA) funded by the Norwegian Ministry of Climate and Environment; and (2) Mobilizing Article 6 Trading Structures (MATS) funded by the Swedish Energy Agency – to complete such transactions, which would be among the first in the world. In Africa, the DAPA Program is being implemented in Morocco and Senegal to develop capacities and enabling frameworks to engage in carbon transactions through a policy approach (Figure 1).³⁹ Following a detailed scoping phase, the energy sector was selected for piloting. Currently, both Morocco and Senegal are in the design phase, to design policy approaches in the energy sector that generate emissions reduction above and beyond the NDCs, which can then be structured into an international carbon transaction under Article 6. This phase will end with the drafting of the Mitigation Outcome Purchase Agreement after which GGGI exits from the transaction process to ensure no conflict of interest.

³⁶ Carbon Pricing Leadership Coalition, "CPLC Workshop - Carbon Pricing in Africa: Opportunities for Action at Sub-National Level," 27 October 2020, https://www.carbonpricingleadership.org/calendar/2020/6/9/cplc-workshop-carbon-pricing-in-africa.

³⁷ Ibid.

³⁸ Safouane, Nacif. GGGI

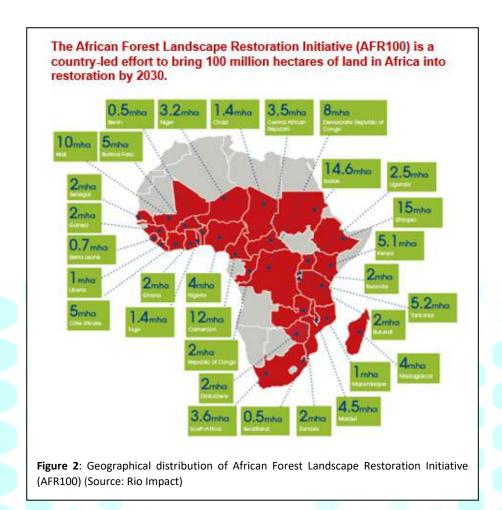
³⁹ For lessons learned on identifying potential policy approaches under Article 6 of the Paris Agreement see: https://gggi.org/site/assets/uploads/2021/01/Policy-Approaches-under-PA-Article-6210121.pdf.



Capacity building and technical assistance are key focus areas to successfully leverage climate and carbon finance with a broad range of support required from setting necessary institutional and governance arrangements, establishing the monitoring, reporting and verification (MRV) infrastructure to accounting procedures. Lessons from the Clean Development Mechanism should be taken into consideration – one of which is the importance of private sector engagement in the carbon market not just for the transition to a low-carbon economy, but also for raising climate finance. Another clear lesson is the need to manage public opinions and perceptions early, and transparency in the implementation of Article 6 through an effective MRV system is key to avoiding negative public perception, which will be hard to reverse. Overselling and transactions that jeopardize the achievement of countries' NDC targets could easily affect public opinion, therefore, being able to balance the potential transfer of mitigation outcomes against NDC targets is crucial.

There is significant untapped potential to leverage climate and carbon finance for the rising demands in nature-based solutions in Africa, particularly solutions that are being implemented by smallholder farmers. Presently, less than 1.7% of global finance flows reach smallholder farmers in Africa. ⁴⁰ Many nature-based solutions do not valorize carbon sequestered or avoided emissions through carbon finance schemes. In Africa, however, there are many promising initiatives that are boosting investments in nature-based solutions but are not yet mainstreamed. For example, the Africa Forest Carbon Catalyst is an initiative of The Nature Conservancy to help local enterprises raise US\$300 million for forest restoration and conservation. The African Forest Landscape Restoration Initiative (AFR100) is a country-led effort to bring 100 million hectares of land in Africa into restoration by 2030 (Figure 2).

⁴⁰ Liagre, Ludwig. Rio Impact. "Climate and Carbon Finance for Nature-Based Solutions in Africa - Challenges and Opportunities," presentation made at Global Green Growth Week 2021, 27 October 2021.



Deliberate efforts to mainstream nature-based solutions in existing climate finance mechanisms such as in the Rwanda Green Fund (FONERWA), Benin's National Fund for Environment and Climate and Namibia's Environmental Investment Fund, are needed. There is also a need to widely share good practices and lessons learned on innovative climate financing approaches, such as blended financing, carbon finance as collateral and green bonds, to reduce risks while catalyzing climate investments.

An innovative example that adopts blended financing for nature-based solutions is Komaza's Smallholders Forestry Vehicle that has raised US\$38 million in equity and grants from a combination of investments funds, philanthropic organizations and others to plant trees and restore degraded agricultural land in partnership with smallholder farmers – with Komaza providing seeds, training and support on optimizing production.

Another innovative example is the use of carbon finance as collateral in the Trees for Global Benefit Program coordinated by ECOTRUST in Uganda. The program aggregates ecosystem services provided by smallholder farmers, sells them to international markets and distributes the proceeds back to the farmers, allowing them to access productive loans from formal financial institutions. These loans are then used to strengthen sustainable agricultural and forest-based activities, such as production of honey and expansion of reforestation activities.

It is important to unlock the potential of compliance markets by boosting their establishment in Africa, as well as capital market resources such as green bonds. There is strong evidence showing that preferential treatment of green bonds can increase green investment share.⁴¹ However, the pass-through to green investment is imperfect with leakage to share buybacks, dividend payouts and cash hoarding. For instance, only 3% of green bonds currently flow into nature-based solutions.⁴² Generally, better data and information is needed for the success of green bonds – countries need to set up environmental information disclosure and green finance standards, and these should be harmonized internationally.

Without financial support, climate change is projected to push tens of millions more Africans into extreme poverty by 2030. It is more important than ever to unlock a diverse range of innovative climate and carbon finance instruments to meet countries' commitments under the Paris Agreement.

ACKNOWLEDGMENT

Speakers:

- Mr. Nacif Safouane, Program Lead, Article 6 Policy Approaches, GGGI
- Mr. Ludwig Liagre, Managing Director, Rio Impact, Luxembourg
- Mr. Matthias Kaldorf, PhD Student, Center for Macroeconomic Research, University of Cologne, Germany
- Mr. Abdelghani Boucham, Head of Climate Change, Department of Sustainable Development, Ministry of Energy Transition and Sustainable Development, Morocco
- Ms. Malin Meyer, Advisor, Ministry of Climate and Environment, Norway
- Mr. Mischa Classen, Director of Carbon Procurement, Klik Swiss Foundation
- Mr. Andrei Marcu, Executive Director, Roundtable on Climate Change and Sustainable Transition

Chair and Moderator:

- Ms. Fenella Aouane, Deputy Director and Head of Carbon Pricing Unit, GGGI
- Ms. Ximena Aristizabal, Global Coordinator of DAPA Program, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.

⁴¹ Kaldorf, Matthias. "The Preferential Treatment of Green Bonds: An Option for EMEs?" presentation made at Global Green Growth Week 2021, 27 October 2021.

⁴² Liagre, Ludwig. "Climate and Carbon Finance for Nature-Based Solutions in Africa - Challenges and Opportunities," presentation made at Global Green Growth Week 2021, 27 October 2021.

8 Urban Resilience Building: African Cities' Green Growth in a changing climate

Agenda

13:50- 14:00 (10 minutes) 14:00-14:20 (20 minutes)

Welcoming participants

Opening: High-level opening remarks: Challenges and opportunities of rapid urbanization in Africa

- Welcoming remarks by H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) (video recording)
- Welcoming remarks by Mayor Soham El Wardini, Mayor of the City of Dakar, Senegal, member of the C40
- Session opening remarks by Abass Ndiaye, Head of Cabinet of the Minister of Urbanism, Housing and Public Hygiene of Senegal

Session Chair: Mr. Romain Brillie, Country Representative to Senegal, GGGI

14:20 -15:10 (50 minutes)

Part 1: African Cities in a changing climate: options for adaptation and mitigation

Moderator: Ms. Christina Cheong, Green Cities Specialist, GGGI

Keynote: Working with cities in Rwanda, Senegal and Burkina Faso to build their resilience, by **Ms. Michelle de Freese**, Senior Officer, Rwanda Program, **GGGI** (10 min)

Presentations - (20 min)

- Presentation 1: Climate Change, Relocation and Resilient Urbanization: increasing employment opportunities, self-sufficiency, and resiliency of urban system, by The Growth Dialogue, United States – (10 min)
- Presentation 2: Energy Efficiency in the built environment in Morocco, by
 Agence Marocaine pour l'efficacité énergétique (AMEE), Morroco (10 min)

Panel discussion - (20 min)

- Mr. Edward Kyazze, Director General of Urbanization and Human Settlements and Housing Development, Ministry of Infrastructure of Rwanda
- Mr. Drazen Kucan, Senior Urban Development and Energy Efficiency Specialist, Division Adaptation & Mitigation (DMA), Green Climate Fund (GCF).

- Mr. Ahmed Himy, Head of Strategic Research, Agence Marocaine pour l'efficacité énergétique (AMEE)
- Mr. Shahid Yusuf, Chief Economist, The Growth Dialogue

15:10 - 15:20

Intersession break: wrapping up Session 1

(10 minutes)

Session Chair: Mr. Romain Brillie, Country Representative to Senegal, GGGI

15:20 -16:10 (50 minutes)

Part 2: The challenges and opportunities of green infrastructure: articulating municipal and sectoral urban planning

Moderator: M. Ale Badara Sy, Senior Officer, Senegal Program, GGGI,

Keynote: Green Cities Strategies for Municipal leadership on green growth, by M. Ale Badara Sy, Senior Officer, Senegal Program, GGGI (10 min)

Presentations - (20 min)

- **Presentation 1:** Urban Forest management planning: How to make Addis Ababa city resilient, by Ethiopian Biodiversity Institute, Ethiopia - (10 min)
- **Presentation 2:** Facilitating sustainable urban economic planning & investments in 12 fast growing municipalities in Kenya, by Sustainable Urban **Economic Development Programme - SUED, Kenya - (10 min)**

Panel discussion - (20 min)

- Mayor Oumar Ba, Mayor of Ndiob City, President of Senegal Green and Ecological Cities Network, Chairman of the Supervisory Board of the Senegalese Agency for Reforestation and the Great Green Wall, Senegal
- Mr. Aklilu Fikresilassie, Director, Thriving Resilient Cities, WRI Africa; & Representative of WRI In Ethiopia
- Mr. Befekadu Mewded, Associate Researcher, Ethiopian Biodiversity Institute, Ethiopia

Ms. Liz Muange, Investment and Value Chain Lead, Sustainable Urban Economic Development Programme (SUED) Kenya, **Closing remarks**

16:10-16:20 (10 minutes)

• By Mr. Dexippos Agourides, Regional Director for Africa, GGGI

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Summary

Africa's 1.1 billion citizens will likely double in number by 2050, and more than 80% of this increase will occur in cities⁴³ – making Africa's urbanization rate among the world's highest. The rapid urbanization, motorization and fossil fuel electrification means that Africa's rate of greenhouse gas (GHG) emissions growth is among the world's highest.⁴⁴ African cities will also be among the most vulnerable to the impacts of climate change.⁴⁵ Coastal cities such as Abidjan, Accra, Dakar, Dar es Salaam and Lagos are highly vulnerable to flooding because of both precipitation events and sea level rise. In 2020 alone, there were 1.2 million disaster-related displacements due to floods, storms and droughts in Africa.⁴⁶ Often, those most affected are living in informal settlements with lack of access to infrastructure and services. The COVID-19 crisis has highlighted the inextricable link between health, the environment and the economy. To recover sustainably, and provide decent green jobs for all, cities need to invest in a thriving, sustainable economy and transition to a model of green, climate resilient growth.

Across Africa, cities are recognizing the importance of green growth and have already taken serious action in this transition to a green growth model of development. GGGI has been working with line ministries and municipal governments to develop green city plans and frameworks in Burkina Faso, ⁴⁷ Rwanda ⁴⁸ and Senegal, ⁴⁹ which has created strong enabling environments to support green transitions in cities through a wide range of initiatives. ⁵⁰ In Burkina Faso, the Social Housing Energy Efficiency Cooling Project is using cost-effective local solutions for efficient cooling in housing. The project is expected to avoid the emissions of 208,824 tCO₂e over ten years. Rwanda is promoting nature-based solutions to increase stormwater run-off retention capacity and build urban resilience. Some examples include: rainwater harvesting, which has demonstrated that retention of 30% of stormwater run-off during the rainy season would meet irrigation requirements for the dry season; restoration of the 120ha Nyandungu Wetland Urban Park in Kigali; and the target to increase tree cover in Kigali by 30%. Senegal is planning to scale rooftop solar in public buildings by installing solar systems on 300 public buildings. This initiative is expected to result in net annual savings of up to USD4.5 million per year and avoid the emission of 80,000 tCO₂e.

Clear opportunities for green growth transition in African cities can be observed across multiple sectors, especially in: (1) waste management, particularly for composting and biogas as an estimated 76% of waste is organic, and for unlocking the circular economy potential; (2) construction since 80% of the buildings projected for 2050 are yet to be built and there are opportunities for incorporating energy efficiency

⁴³ Muggah, Robert and Hill, Katie. "African cities will double in population by 2050. Here are 4 ways to make sure they thrive," World Economic Forum, 27 June 2018, https://www.weforum.org/agenda/2018/06/Africa-urbanization-cities-double-population-2050-4%20ways-thrive/.

⁴⁴ Yusuf, Shahid. "Climate Change, Relocation, and Resilient Urbanization," presentation made at Global Green Growth Week 2021, 27 October 2021.

⁴⁵ Ibid.

⁴⁶ World Meteorological Organization, *State of the Climate in Africa 2020* (Geneva, 2021), https://library.wmo.int/index.php?lvl=notice display&id=21973#.YZYQ7WBByUk.

⁴⁷ Burkina Faso's Ministry of Housing and Town Planning, "Guidelines for the Implementation of the National Green Cities Policy in Burkina Faso," 2019.

⁴⁸ Rwanda's Ministry of Infrastructure and GGGI, "National Roadmap for Green Secondary City Development," 2015, https://gggi.org/site/assets/uploads/2017/12/National-Roadmap-for-Green-Secondary-City-Development.pdf.

⁴⁹ Government of Senegal, "Green Secondary Cities Development Framework Guidelines," 2016.

⁵⁰ DeFreese, Michelle. "Working with Cities in Rwanda, Senegal, and Burkina Faso to Build their Resilience," presentation made at Global Green Growth Week 2021, 27 October 2021.

guidelines and standards for new buildings; and (3) transport in which GHG emissions are rising the fastest, there are opportunities to optimize public transport and introduce e-mobility.⁵¹

Financing these adaptation and mitigation options is a challenge, and cities need to leverage diverse financing options, both internationally from the Green Climate Fund, Adaptation Fund, Global Environment Facility and various development banks, as well as locally through enhancement of municipal revenue generation and private sector engagement. In Morocco, local authorities of Sala Al Jadida adopted a public-private partnership approach to install and manage energy-efficient public lighting in the city of Salé with the aim to reduce 41% of energy use. This pilot initiative resulted in increased rate of light availability from 68% to 93% between 2015 and 2016, and reduced intervention delay time from 96 hours to 26 hours between 2014 and 2016.⁵² Some of the lessons learned include the need to set clear responsibilities for stakeholders involved in the partnership, and the importance of communication and engagement with the public in managing needs and expectations. The successful experience from this partnership for public lighting has been replicated in other cities in Morocco.

African cities have large gaps in basic infrastructure – with the continent facing financing shortfalls of up to US\$108 billion annually.⁵³ A study by the World Bank and World Resources Institute provides evidence that the integration of nature-based solutions in infrastructure projects enhances overall system performance and climate resilience, oftentimes at a lower cost.⁵⁴ A key recommendation for green infrastructure deployment is integrated and holistic urban planning across sectors and administrative boundaries, involving stakeholders from government, the private sector and civil society.

However, the lack of human and institutional capacities to plan and manage cities' infrastructure in an integrated and holistic manner, coordinate with multiple stakeholders, and mobilize financial resources are common challenges. Recognizing these challenges, the Sustainable Urban Economic Development Programme is supporting 12 fast-growing municipalities in Kenya to develop sustainable urban economic plans and attract green infrastructure investment. The program applies principles of climate resilience, resource efficiency, social inclusion and low-carbon development in urban infrastructure planning and development. Additionally, the program adopts a value chain approach to foster integration and inclusion. For example, the Sustainable Urban Drainage Project in Isiolo brought together multiple stakeholders to design interventions that simultaneously create economic value (promote tourism) and build climate resilience (reduce flood risk, increase water supply and incorporate nature-based solutions).

The majority of cities – especially smaller cities – rely on national governments and grants from donors to finance urban infrastructure projects, which may be unpredictable, insufficient or not well aligned to local planning priorities. Innovative financing mechanisms and a suite of different financial instruments are critical to spur investments in bridging the infrastructure gap. Green infrastructure opens new funding options to tackle the infrastructure financing gap, including grants, subsidies, mission-driven investors and green bonds. Green infrastructure also offers opportunities for cities to address multiple challenges concurrently and engage in regionwide sustainable development efforts. For instance, Addis Ababa,

⁵² Himy, Ahmed. "Energy Efficiency in the Built Environment," presentation made at Global Green Growth Week 2021, 27 October 2021.

⁵¹ Ibid.

⁵³ The Kenyan Wall Street, "Africa Infrastructure Index; \$108B financing gap," 24 January 2018, https://kenyanwallstreet.com/africa-infrastructure-ranking-108b-financing-gap/.

⁵⁴ World Bank and World Resources Institute, "Integrating Green and Gray: Creating Next Generation Infrastructure," 2019, https://www.wri.org/research/integrating-green-and-gray-creating-next-generation-infrastructure.

Ethiopia recognizes that merely increasing tree canopy does not guarantee sustainability and city resilience. The Ethiopian Biodiversity Institute is championing the increase in tree species diversity and prioritizing indigenous species in urban forests of Addis Ababa through scientific research to inform policymaking and awareness raising. In Senegal, its cities have been at the forefront of green infrastructure building as part of the continent's Great Green Wall initiative through reforestation contracts between cities and the reforestation agency, which is a successful collaborative model that can be replicated in other countries.

In ensuring integrated, multi-sectoral and holistic green infrastructure planning, collaboration is key among different actors, including national and local governments, researchers, service providers, financial institutions, communities and others. Senegal, for example, has established a green, sustainable, smart and resilient cities platform with GGGI's support, bringing together these different actors to share good practices and innovations, and work collaboratively to create low-carbon, climate-resilient cities. Knowledge exchange and partnerships at the international level is also crucial and many African cities are members of various networks such as C40, ICLEI and the Resilient Cities Network. Cities are central to the global sustainability agenda and green growth transition. Greening cities provide opportunities to create sustainable livelihoods and green jobs, reduce GHG emissions, and increase access to sustainable infrastructure and services.

ACKNOWLEDGMENT

Speakers:

- Mayor Soham El Wardini, Mayor of the City of Dakar, Senegal,
- Mr. Abass Ndiaye, Head of Cabinet, Ministry of Urbanism, Housing and Public Hygiene, Senegal
- Ms. Michelle de Freese, Senior Green Growth Officer, Rwanda Program, GGGI
- Mr. Edward Kyazze, Director General of Urbanization and Human Settlements and Housing Development, Ministry of Infrastructure, Rwanda
- Mr. Drazen Kucan, Senior Urban Development and Energy Efficiency Specialist, Adaptation and Mitigation Division, Green Climate Fund
- Mr. Ahmed Himy, Head of Strategic Research, Agence Marocaine pour l'Efficacité Energétique, Morocco
- Mr. Shahid Yusuf, Chief Economist, Growth Dialogue
- Mayor Oumar Ba, Mayor of Ndiob City, President of Senegal Green and Ecological Cities Network, Chairman of the Supervisory Board of the Senegalese Agency for Reforestation and the Great Green Wall, Senegal
- Mr. Aklilu Fikresilassie, Director, Thriving Resilient Cities, WRI Africa and Representative of WRI in Ethiopia
- Mr. Befekadu Mewded, Associate Researcher, Ethiopian Biodiversity Institute, Ethiopia
- Ms. Liz Muange, Investment and Value Chain Lead, Sustainable Urban Economic Development Programme, Kenya
- Mr. Dexippos Agourides, Regional Director for Africa, GGGI

Chair and Moderators:

- Mr. Romain Brillie, Country Representative of Senegal, GGGI
- Ms. Christina Cheong, Green Cities Specialist, GGGI
- Mr. Alé Badara SY, Senior Officer, Senegal Program, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-building-green-cities/.

ASIA-PACIFIC SESSIONS

Overview of sessions

25 October 2021	26 October 2021	27 October 2021		
Low Emissions Climate Resilient Development in the Pacific	The Evolution of Carbon Pricing Policies and Market Mechanisms	Increasing Access to Climate Finance in the Pacific		
The role of Green Investments & Innovative financing mechanisms	Enhancing Countries' Direct Access to Climate Finance (Asia and the Pacific)	Implementing NDCs in the Pacific		
Electric Mobility Transition: Insight from Emerging Economies in Asia and Africa	Sustainable Landscape and Climate Smart Agriculture Solutions in Asia/Pacific	Blue Economy & Coastal Resilience Building: Climate Smart Solutions for Sustainable Livelihood in Asia/Pacific		
Energy Efficiency: Pathway to sustainability	Waste-2-Energy Potential to scale-up renewable energy access: Examples of Biofuels	Green Hydrogen Economy in GGGI member countries		
Inclusive Green Growth: Partnership for Climate Resilient Urban Development	Accelerating progress on Korea's Net Zero 2050 target	Scaling-up Renewable Energy Solutions for Ambitious Net- Zero 2050 Targets		
Green Recovery Approaches and Innovative Finance for Developing and Emerging Economies	Greenpreneurs Global Program 2021 Edition	The Road to COP26: what does success look like for developed and developing countries?		
	Closing the Loop: Circularity in the Built-Environment	Greening Buildings and Infrastructure in Asia: Certification, Partnerships and Finance		
Global Green Growth Week 2021	Long-term strategies, NDCs, and BTRs: Tools and Lessons for 2050 net-zero	Circular Economy & Waste: Views from donors, countries, and private sector		

Welcoming remarks by GGGI President & Chair H.E. Mr. Ban Ki-moon

Dear distinguished participants, Ladies and gentlemen,

It is my pleasure to welcome all of you—the moderators, speakers, panelists, and all participants from Asia and the Pacific—to this session of the Global Green Growth Week 2021.

Although this year's GGGWeek will take place virtually due to the COVID-19 pandemic, my hope is that it will be more "green", provide an opportunity for broader participation from more regions and sectors of the world, and ultimately lead to bigger impacts.

GGGWeek2021 is a platform for experts and practitioners from all over Asia and the Pacific regions to discuss and share about their experiences, along with innovative ideas and solutions on:

- renewable energy and energy efficiency,
- finance mechanisms to mobilize green investments,
- carbon pricing,
- · flood resilient buildings,
- blue economy,
- sustainable landscapes,
- circular economy
- and more.



I am very pleased to witness the carbon neutrality commitments by 2050 from both governments and private sectors in Asia and the Pacific.

Because the current path of growth—dependent on fossil fuels and focused on short-term growth—this is not an option.

We need to adopt green growth—a model of growth that is environmentally sustainable and socially inclusive.

The Asia-Pacific region has numerous climate-induced obstacles to overcome including extreme natural phenomena.

But it is not just extreme weather events and natural phenomena.

We can read and hear—almost on a daily basis now—about how climate change fuels conflicts, spurs migration, and poses serious health risks to people everywhere.

It is absolutely crucial that we turn carbon neutrality pledges into action and develop sustainable solutions to solve this crisis and build back better.

For many, it requires resiliency plans and adaptation projects, like those GGGI is supporting for its Members in the Pacific.

The solutions you discuss in this session can play a major role in the implementation of a green COVID recovery and the climate crisis.

As you dive deeper into these topics, I encourage you to actively collaborate in discussions, share best practices and lessons learned, and help us work together to achieve carbon neutrality, recover from the pandemic, and build resilient and sustainable communities.

I would like to express my appreciation for your valuable participation in this year's GGGWeek, and I wish each and every one of you all the best in strengthening existing partnerships and developing new ones.

Thank you.

Session details

9 Low Emissions Climate Resilient Development in the Pacific

Agenda

09:40-10:00 (20 minutes)

Welcoming Remarks

H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)

H.E. Philip Turner, Ambassador of New Zealand to the Republic of South Korea.

GGGI's programmatic earmarked approach in the Pacific under the LECRD Dr. Frank Rijsberman, Director General, Global Green Growth Institute (GGGI).

10:00-10:40 (40 minutes)

High-Level Panel: PICs undertaking LECRD work on the ground

Chair: Daniel Muñoz-Smith, Country Representative for Fiji, Kiribati, Tonga and Vanuatu, Global Green Growth Institute (GGGI).

Panelists:

- Ms. Teaaro Otiuea, Deputy Director, Agriculture & Livestock Division, Ministry of Environment, Lands and Agriculture Development (MELAD), Republic of Kiribati. "Climate Smart Agriculture to adapt to climate change".
- Ms. Akesiu Meimoana Leua Kautoke, Mitigation and Climate Change Reports Division, Department of Climate Change, Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication (MEIDECC). Kingdom of Tonga. "An Opportunity for Transformation: Experiences from Tonga's LTS & Lessons for the Pacific".

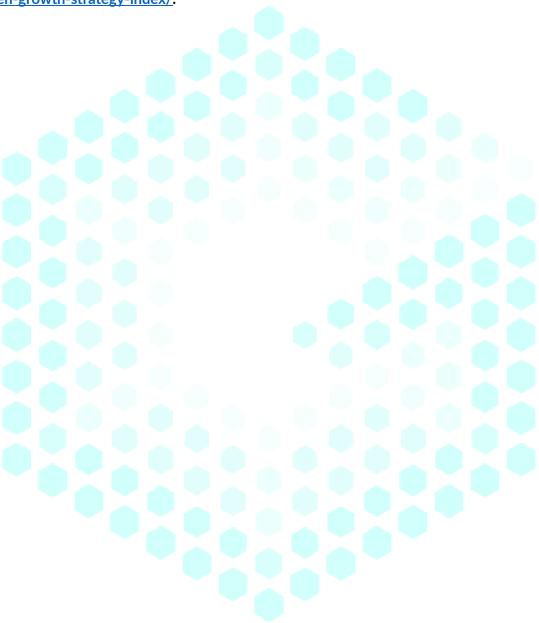
Session overview

Pacific Island Countries face significant challenges to meet their ambitious targets to mitigate climate change, given the limited amount of finance being allocated towards Low Emissions Climate Resilient Development. This is underpinned by both often narrowly defined projects, dispersed policy frameworks and-or limited ability to operationalize related planning efforts. In addition, PIC's and their small economies, face exacerbated risks and vulnerability given their great exposure to natural disasters and other coastal phenomena impacting livelihoods of communities.

New Zealand and GGGI have partnered with Fiji, Tonga, Vanuatu, PNG and Kiribati under the LECRD Program, as a new and innovative programmatic approach to address these issues, as a necessity to leverage existing experiences and place them into comprehensive policy and legislative frameworks, ultimately to support governments integrating climate and development into planning, policies, and action across multiple sectors and implementation levels.

Government representatives partnering with GGGI from New Zealand, Tonga and Kiribati, will address and share what they are doing to shape their regulatory frameworks, including sectoral approaches in climate smart agriculture and long-term planning -and other matters.

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.



10 The role of Green Investments & Innovative financing mechanisms

Agenda

11:00-11:05

Opening and Welcome Remarks

(5 minutes)

- H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) - via video
- Dr. Lasse Ringius, Director and Lead, Green Investment Services, Global Green Growth Institute (GGGI)

11:05-12:45

(100 minutes)

Presentations

- Mr. Michael Dolan and Mr. Jannata Giwangkara, ClimateWorks Australia Low Carbon Energy Transition in Southeast Asia: Scaling-up catalytic financing inflows from private and public sources to accelerate transition
- Dr. Lasse Ringius, GGGI Experience in Accelerating Access of Members and Partners to Climate Finance: Lessons Learned from 2015-2020
- Dr. Hanna Kang & Dr. Min Cheol Kim, Green Technology Center Korea Status of Green Recovery Spending in Developing Countries: With the Focus on Green Climate Technology (GCT)
- Mr. Jacob Hensel, Greeningfinance.org Investing Wisely: Temperature Scores and a Greener Investment Portfolio
- Mr. Soo-hyun Lee, Seoul National University Asia Centre Formulating a Single UN Framework for the Role of International Investment in Sustainable Development

12:45-13:00

(15 minutes)

Q&A and Closing

Dr. Lasse Ringius, Director and Lead, Green Investment Services, Global Green Growth Institute (GGGI)

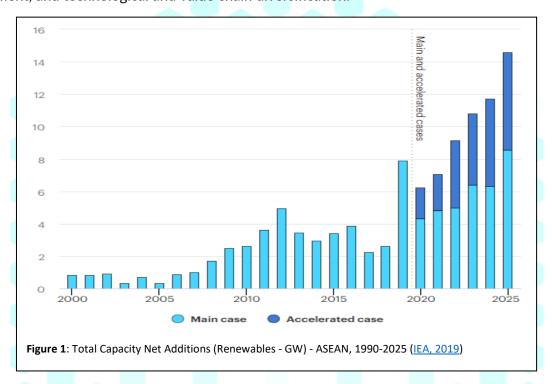
Summary

There is an urgent need to increase the flow of investment into developing countries and emerging markets to meet the targets of the Paris Agreement and to achieve the Sustainable Development Goals (SDGs). Governments around the world have pledged billions of dollars to reach these targets and goals, and there are large sums of private sector capital that could be marshalled to invest in green climate projects.

Yet there are not enough viable projects to attract financing. The reasons for this dilemma are manifold, including a complex climate finance system and a lack of projects meeting investor requirements for financial, economic, and technical feasibility. Private investors often perceive green climate projects as high-risk and low-reward propositions.

Development of a strong pipeline of bankable projects has become a key priority to attract financing to green climate projects in developing countries and emerging markets. This is urgent because current levels of climate ambition are not on track to meet Paris Agreement targets, and COVID-19 may have slowed the speed in achieving net-zero pathways.

Asia continues to rely heavily on oil and coal to meet its energy needs. Energy-related emissions increased by an average of 4% in ASEAN between 2010 and 2019. Without significant efforts to decarbonize, such emissions expected to almost double by 2040. Across the 10 ASEAN Member States, renewables have been growing at a rate of 7.7% (CAGR) in the last five years (2016-2020), translating to an average of 6.4 GW of new renewables added annually (Figure 1) where renewables only currently account for approximately 15% of the region's current energy demand. Reducing emissions would generate a range of benefits, including better health outcomes, improved energy security, and opportunities for green employment, and technological and value chain diversification. 55



Although more private financing is critical to increasing the availability of renewable energy in ASEAN, public climate financing is also important to reduce the cost of capital for large-scale projects. To reduce the cost of capital, leading IMF shareholders and multilateral concessional funds could provide additional financing, for example by increasing the share of Special Drawing Rights (SDRs) received by ASEAN members. In addition, multilateral development banks could expand the available pool of debt financing by helping countries establish a track record, develop market maturity, and improve credit ratings.⁵⁶

Many technologies are available to support climate mitigation and adaptation toward a post-pandemic green recovery, including transport and building efficiency, climate information and warning systems, and low power consumption equipment. Public and private institutions that offer first-loss and guarantor mechanisms can do more to de-risk projects and thereby reduce the burden on governments to initiate low-carbon projects.⁵⁷

⁵⁵ Giwangkara, Janata and Michael Dolan, ClimateWorks Australia.

⁵⁶ Ibid.

⁵⁷ Kang, Hanna and Min Chul Kim, Green Techology Center-Korea.

Public climate finance over the past decade has fallen far short of the \$100 billion committed at COP15, making low- and middle-income countries more dependent on non-concessional forms of financing. Green recovery spending by developing countries has been inadequate, representing just 11.6% of total recovery spending in 18 countries studied. However, Bangladesh stands out for the high share of green recovery spending within its overall recovery spending. Nearly all green recovery spending in developing countries is for green climate technology.⁵⁸

Investors can better align their portfolios with low-carbon trajectories by determining a "temperature score", a measure of carbon-intensity. The score represents the global mean temperature increase in 2050 (or another time period) if the entire economy had the same emissions intensity of the investment portfolio. The carbon intensity measure, e.g., emissions per value of goods and services estimated at 2.3 tons of CO_2 per US\$1 million in sales, is a methodology can also be applied to the production of goods or services by a company, and at the portfolio level.⁵⁹

More generally, there is no single international framework for assessing how much an international direct (or portfolio) investment contributes to sustainable development. Such a framework could assess a company's claims about the impact of its activities in other countries. In the current absence of such a framework, there has been some convergence around the meaning of sustainable development, as exemplified by the SDGs and the three dimensions of sustainable development (economic, environmental and social). A research project jointly undertaken by the United Nations (UN) Development Programme, Seoul National University and Lund University has analyzed instruments and initiatives across the UN to construct a definitive framework that aligns with the UN's conception of the role of international investment in sustainable development.

Governments should prioritize green investments since they generate economic and social benefits while reducing emissions. Among the ways in which donor countries can support the green transition is by increasing green ODA, diversifying investments in adaptation, and developing technology demand-supply matching systems.⁶²

GGGI is helping to conceptualize, design and finance projects. It offers project preparation support, connects projects with suitable sources of finance, and designs national financing vehicles to use climate finance. In addition, it is designing innovative financial instruments to reduce risk. In terms of thematic classification, most of GGGI's 59 projects (as of 2020) contribute to the development of solar and the sustainability landscape, including areas like forestry and irrigation. There are more GGGI projects in Asia than in any other world region. GGGI's cumulative investment, 2015-2020, exceeds \$2 billion – 41% from private sector – as detailed in the table 1 and Figure 2.⁶³

⁵⁸ Ibid.

⁵⁹ Hensel, Jacob, GreenFinance.org.

⁶⁰ Lee, Soo-hyun, Seoul National University.

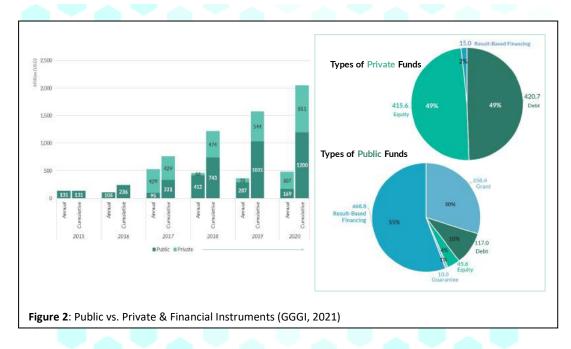
⁶¹ Ibid.

⁶² Kang, Hanna and Min Chul Kim.

⁶³ GGGI, Technical Report No. 20: Closing the Climate Financing Gap: Stocktaking of GGGI Investment Projects 2015-2020, as shared by Lasse Ringius at the session.

Table 1: Sources of green and climate investments in GGGI 2015-2020 portfolio (GGGI, 2021)

Type of Investors	Total	Results-based financing	Debt	Equity	Grant	Guarantee
Private company/business	629.3	0	274.8	354.4	0	0
Development agency	524	430	0	0	94	0
International climate fund	229.1	103.8	23.9	4.7	96.7	0
Local government	211.1	0	38	40.9	132.2	0
Local state-owned company	186.1	0	133.1	52.9	0	0
Global carbon fund	110	110	0	0	0	0
Development financial institution	57	25	22	0	0	10
National financing vehicle	39.5	0	5	0	34.5	0
Multilateral development bank	26.3	0	25.4	0	0.9	0
Impact investor	23	15	4.8	3.2	0	0
Local private bank	13	0	8	5	0	0
Local public bank	2.7	0	2.7	0	0	0
Total	2051	683.8	537.7	461.1	358.4	10



Attracting more private finance into green climate projects is essential to accelerating the green transition. Expanding the use of innovative finance mechanisms, harnessing diverse technologies, setting ambitious clean energy targets, improving use of data and measurement of sustainability, and increasing public spending for mitigation and adaptation are among the actions required to accelerate the green transition in Asia.

ACKNOWLEDGMENT

Speakers

- Janata (Egi) Giwangkara, Senior Project Manager (Energy Systems), ClimateWorks Australia &
- Michael Dolan, Project Manager International and Country Context, ClimateWorks Australia
- Lasse Ringius, Director, Green Investment Services Global Practice, GGGI
- Hanna Kang, Postdoctoral Researcher, Green Technology Center-Korea &
- Min Chul Kim, Director, Division of Policy Research Green Technology Center-Korea
- Jacob Hensel, Founder, GreeningFinance.org
- Soo-hyun Lee, Visiting Scholar Fellow, Seoul National University

Moderator

Lasse Ringius, Director, Green Investment Services Global Practice, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.



11 Electric Mobility Transition: Insight from Emerging Economies in Asia and Africa

Agenda

14:00-14:07

Welcoming Remarks

(7 minutes)

Christophe Assicot, Co-lead, GGGI Community of Practice on Sustainable Transport H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)

14:07-14:45 (38 minutes)

Presentations: "Insights from Emerging Economies"

 Policy and Technical Standards Development for Electric Vehicles in Lao PDR

Mr. Christophe Assicot, Deputy Country Representative Lao PDR, GGGI

- 2. E-cyclo for UNESCO Heritage city of Siem Reap, Cambodia Mr. Delly Kong, CEO, Neron Energy
- 3. Kiira Motors, Mission Vehicles Made in Uganda Mr. Paul Isaac Musasizi, CEO, Kiira Motors Corporation
- 4. Transport decarbonization in the City of Kigali Mr. Francois Zirikana, e-mobility specialist, City of Kigali

Facilitator: Ms. Eileen Hur, Office of IPSD, GGGI

14:45-15:40 (55 minutes)

High-Level Panel: "How to accelerate sustainable mobility practices in developing countries?"

Moderator: Michelle DeFreese, Senior Green Growth Officer, GGGI

Panelists:

Mr. Koen van Baekel, Director, Rebel Group International

Mr. Bert Fabian, Programme Officer, Sustainable Mobility Unit, Economy Division, UNEP

Mr. Serge Kamuhinda, CEO, Volkswagen Mobility Solutions

Dr. Jana Plananska, Expert in Electric Mobility Management

Mr. Stephane Carcas, Deputy Head, Mobility and Transport Division, AFD

Q&A session

15:40-15:45

Closing

(5 minutes)

Kyung Nam Shin, Assistant Director General, GGGI

Summary

Government responses to the COVID-19 pandemic included reforms that aim to reduce future exposure of national economies to exogenous shocks. Examples include the establishment of domestic value chains, the sustainable use of local natural resources, and the creation of new inclusive business opportunities. These are consistent with adoption of e-mobility practices.

Domestic renewable energy sources can power the electrification of the transport sector, which reduces demand for imported fossil fuels, and strengthens both energy security and a country's balance of payments. Improving affordable public mobility services generates economic opportunities for more vulnerable parts of the population. Cleaner transport modes create environmental co-benefits, such as the reduction of noise, emissions of greenhouse gas and local pollutants, thereby contributing to improved public health.

Electric vehicles (EVs) are cheaper to operate than internal combustion engine (ICE) vehicles. But their widespread adoption faces obstacles such as user concerns about driving range, charging time and limited scope of supply. Investors seek improved policy frameworks, enhanced public awareness, broader financing options, and more innovative business models. Electrification of transport networks is at a nascent stage in most developing countries.

In Lao PDR, GGGI has collaborated with the government to produce a soon-to-be-published report on supporting policy and technical standards development for e-vehicles. Analysis shows that e-vehicles would quickly become more cost efficient than internal combustion engine vehicles in Lao PDR, in part due to the country's natural endowment of hydropower. But gaps in the policy environment must be overcome, including absence of an import permitting process for EVs, lack of a policy for EV charging, and a need to compensate for the expected loss of fuel tax revenue while keeping the total cost of EV ownership attractive. GGGI key recommendations to Lao PDR government include a set of EV charging standard, the need to have certificates from original equipment manufacturer, a sustainable battery recycling policy. Fiscal measures, development of innovative financing mechanisms such as EV Financing Facility, awareness raising and skill development program by private players, manufacturers and government, are all part of the actions needed to make EV more attractive. It also requires a structured communication and awareness raising of stakeholders, like the PACE initiative from GGGI (Figure 1).

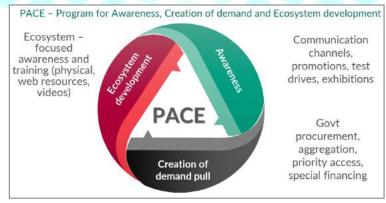
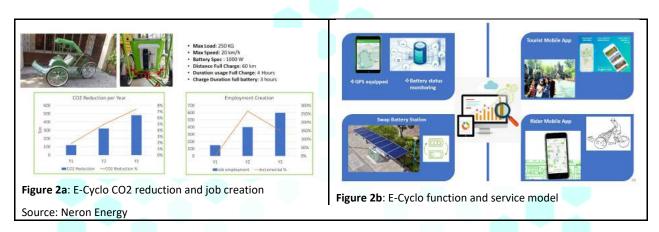


Figure 1: Program for Awareness, Creation of demand and Ecosystem deployment (Source: GGGI Lao PDR)

⁶⁴ Assicot, Christophe, GGGI Lao PDR.

In neighboring Cambodia, Siem Reap, home of the Angkor UNESCO World Heritage Site, receives about 3 million tourists annually (pre-pandemic). The start-up Neron aims introduce an electric version of the iconic three-wheeled taxi, the cyclo, to shuttle visitors. By 2024, Neron aims to build solar-powered battery swap stations, reduce carbon emissions by 500 tons, employ hundreds of workers, and roll out 1,000 e-cyclos that can be ordered via a mobile app (Figures 2a and 2b). The vehicles will be mobilized in both Siem Reap and the Cambodian capital, Phnom Penh. 65



The City of Kigali, Rwanda is actively promoting electric mobility, non-motorized transport, public transport, car-free zones, and car-free days as part of the city's transport decarbonization initiative for the rapidly growing and fossil fuel dependent sector. Among the fiscal measures adopted to encourage emobility are the capping of electricity tariffs for charging stations; exemptions on VAT, and import and excise duties, for EVs, spare parts, batteries and charging station equipment; and imposition of a carbon tax to discourage polluting vehicles. E-mobility penetration is also supported by non-fiscal measures including rent-free government land for charging stations, provision of the EV charging stations in the building code and city planning rules, preferential parking and congested zones access for EVs, free license and authorization fees for commercial EVs, and dedicated traffic lanes providing access to high occupancy vehicles (dedicated Bus lanes). Kigali boasts hundreds of EVs and dozens of charging stations. Together with the administrative measures in place, these fiscal and non-fiscal measures drive the SolutionPlus Project to support urban electric mobility in Rwanda (Figure 3).⁶⁶

⁶⁵ Kong, Delly, Neron Energy.

⁶⁶ City of Kigali, François Zirikana



Figure 3: City of Kigali SolutionPlus initiative (Source: City of Kigali, François Zirikana)

Ghana's state-owned Kiira Motors Corporation is manufacturing electric cars and buses. The government has included promotion of local manufacturing of motor vehicles and auto parts, and development of environmentally friendly transport solutions, in its National Development Plan and NRM Manifesto 2021-2026. Needed steps to promote e-mobility include adding EVs to the motor vehicle registration process, building out a charging infrastructure, establishing a mobility value chain skilling program in institutions of higher education, and institutionalizing mobility standards and regulations to support safety and environmental objectives.

Experts note the myriad obstacles to financing electrification of transport networks, including a breakeven point for investment that extends beyond the risk tolerance and patience of investors. Public sector funds are needed to catalyze private financing.⁶⁷ In addition, governments often lack the capacity to assess, plan and implement e-mobility solutions (e.g., how to register EVs, use of bicycle lanes by e-bikes). Governments can incentivize consumer purchases of EVs by increasing taxes on ICE vehicles, as has been shown in Sri Lanka and Mongolia.⁶⁸

The lack of charging infrastructure, unreliable energy grids, and consumer values and interests that do not align with purchase of EVs present additional challenges. Further, entrenched ICE vehicle interests, like auto dealers, can resist the adoption of EVs. It is important not to simply cut and paste EV policies from one country to another as circumstances can be very different.⁶⁹

Electrification of transport networks also requires the support of local political officials, a proper institutional and legal framework, fiscal and nonfiscal incentives, and an appreciation by vehicle operators that despite the higher upfront cost of an EV, may be cheaper than an ICE vehicle when total cost ownership is considered. That said, EVs are not suitable everywhere, depending on the energy mix and

⁶⁷ van Baekel, Koen, Rebel.

⁶⁸ Fabian, Bert, UNEP.

⁶⁹ Plananska, Jana, independent expert.

reliability in the provision of energy. Still, there are other ways to decarbonize the transport sector, including the use of non-motorized transport.⁷⁰

There is growing government commitment for the electrification of transport networks in Africa and Asia, but several finance-related, regulatory, and other obstacles must be overcome to scale promising initiatives. Private and public partners, like AFD and UNEP, are providing critical funding, policy support, and technical advice to governments. Creating accessible and affordable mobility alternatives to ICE vehicles will make an important contribution to the global green transition.

ACKNOWLEDGMENT

Speakers

- Christophe Assicot, Deputy Country Representative, GGGI Lao PDR
- Delly Kong, Co-founder and CEO, Neron Energy
- Francois Zirikana, e-Mobility Specialist, City of Kigali
- Paul Isaac Mussasizi, CEO, Kiira Motors Corporation

Moderator

- Eileen Hur, Transport Associate, GGGI
- Michelle de Freese, Senior Green Growth Officer, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-coastal-resilience-sustainable-transport/.

⁷⁰ Carcas Stéphane, AFD.

12 Energy Efficiency: Pathway to sustainability

Agenda

16:00-16:05 (5 minutes)	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)		
16:05-16:15 (10 minutes)	Setting the scene: The key role of energy efficiency for sustainability		
(10 minutes)	Keynote speaker: Mr. Drazen Kucan, Sector Lead / Senior Urban and Energy Efficiency Specialist, GCF		
16:15-16:50 (35 minutes)	Panel 1: Entry points to enhancing energy efficiency Chair: Christina Cheong, Green Buildings Lead, GGGI		
	Presenters (5minutes each): Mr. Bradley Abbot, Project Lead, Switch Garment, GGGI Mr. Rio Jon Piter Silitonga, Research Analyst, ASEAN Center for Energy Mr. Arrabothu Dheeraj, Senior Green Building Officer, GGGI Ms. Sumedha Malaviya, Program Manager, WRI ZCB Accelerator		
	Interactive discussions (with presenters)		
16:50-17:20 (30 minutes)	Panel Discussion: Overcoming barriers, stimulating action Chair: Christina Cheong, Green Buildings Lead, GGGI Presenters (5minutes each): Ms. Tsolmon Namkhainyam, Officer, Energy Program, GGGI Mr. George Asiimwe, Senior Urban Development Officer, GGGI		
	Interactive discussions Panelists: Mr. Drazen Kucan, Sector Lead / Senior Urban and Energy Efficiency Specialist, GCF Ms. Tsolmon Namkhainyam, Officer, Energy Program, GGGI Mr. George Asiimwe, Senior Urban Development Officer, GGGI Ms. Vida Rozite, Programme Manager, Energy Efficiency Division, IEA		
17:20-17:30 (10 minutes)	Closing remarks Ms. Vida Rozite, Programme Manager, Energy Efficiency Division, IEA		

Summary

Increasing energy efficiency is a cost-effective way to reduce energy demand without affecting access to affordable energy by underserved populations. Energy efficiency represents around 40% of the

greenhouse gas reduction potential that can be realized at a cost of less than €60 per metric ton of carbon dioxide equivalent (tCO₂e).⁷¹ Adoption of energy efficiency at scale generates co-benefits, like employment (IEA estimates that 9-30 jobs would be created for every one million dollars invested in energy efficient measures in the buildings sector)⁷².

The GDP of emerging cities, like Bangalore and Kunming, is expected to increase substantially to 2030, along with emissions. Integrated, cross-sectoral mitigation activities in urban areas can have a transformational impact.⁷³ Action in urban areas could reduce a set of core GHG emissions – those associated with buildings, transport, and waste disposal – by 24% by 2030, and by 47% by 2050.⁷⁴ Dense urban development leads to less urban energy use overall, and can improve the well-being of urban residents while contributing to climate change mitigation.⁷⁵

Buildings account for more than 30% of global energy use, as well as 30% of energy-related CO₂ emissions. IEA estimates that 71% of energy related GHG emissions come from cities, and that figure will reach 76% by 2030. Actions to improve energy efficiency in buildings include retrofitting buildings, targeting support to social housing and government buildings to kick-start energy efficiency moves, and replacing old household appliances with highly efficient and connected appliances.⁷⁶ Other policy responses include increasing incentives for building efficiency improvements; developing smart energy management solutions and on-site renewables; targeting efficiency improvement measures to households and businesses most impacted by the crisis; using public procurement efficiency retrofits of public assets; and providing guarantees to encourage energy service companies to invest in retrofits.⁷⁷

In 2020, ASEAN Energy Efficiency Strategy (Figure 1) set a target to reduce energy intensity by 32% in 2025 based on 2005 levels, and to encourage further energy efficiency and conservation efforts, especially in transport and industry sectors.⁷⁸ The ASEAN Sustainable Buildings Roadmap calls for efficient, low-carbon and resilient buildings; improved systems and operations; low-carbon materials; low-carbon urban planning; and clean and renewable energy integration. ASEAN operates an awards program to recognize the adoption of green and energy efficient buildings.⁷⁹

⁷¹ McKinsey (2009) Pathways to a Low-Carbon Economy: Global Greenhouse Gas Abatement Cost Curve (Version 2), https://mck.co/3nLaW5x.

⁷² IEA (2020) Sustainable Recovery at http://www.iea.org/reports/sustainable-recovery.

⁷³ UNFCCC Technical Paper 13 (2014).

⁷⁴ Erickson, Peter and Kevin Tempest (2014) Advancing Climate Ambition: How City-Scale Actions can Contribute to Global Climate Goals, SEI Working Paper No. 2014-06.

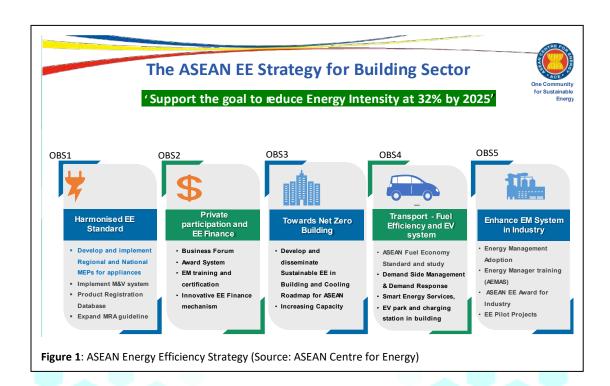
⁷⁵ Kučan, Dražen.

⁷⁶ IEA, op. cit.

⁷⁷ Kučan, Dražen.

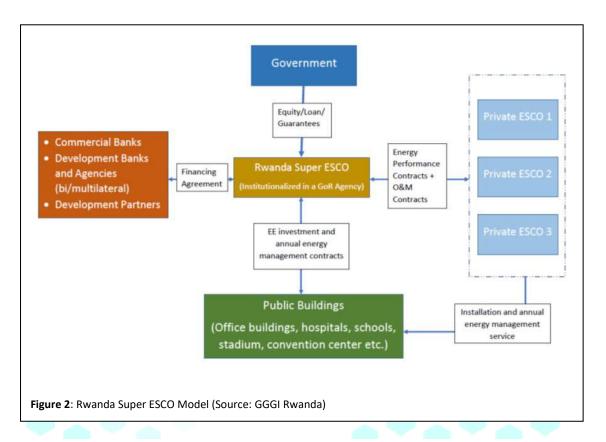
⁷⁸ ASEAN (2020) ASEAN Plan of Action for Energy Cooperation (APAEC) 2016-2025 Phase II: 2021-2025.

⁷⁹ ASEAN Energy Awards: https://aseanenergy.org/work/award/.



In Rwanda, GGGI has assisted the public housing authority in preparing a mandatory green building code for large-scale buildings and has conducted several energy audits of government buildings. GGGI work with the country has identified several areas for action, such as upgrading lighting systems to LED, placing grid-connected solar PV on building rooftops, phasing out AC systems with ODP refrigerants, retrofitting building envelopes, and installing smart, virtual sub-metering devices to measure energy consumption. These actions could generate a large reduction in government energy bills, but first various challenges must be overcome, including uneven willingness of asset owners to retrofit and upgrade, and a lack of available data. The Super ESCO Model institutionalized in Rwanda provides the solution to address these challenges. (Figure 2).

⁸⁰ Arrabothu, Dheeraj.



The Building Efficiency Accelerator (BEA) is a public-private collaboration that works to accelerate local government implementation of building efficiency policies and programs internationally. It matches cities with available expertise, technical resources and tools, and tracks action, documents progress, and shares lessons learned. Since 2015, BEA has collaborated with 59 cities in 26 countries, and more than 50 partner organizations. WRI's Zero Carbon Buildings (ZCBs) Accelerator builds on the BEA's work by assisting two cities in Colombia, and two more in Turkey, in achieving a zero-carbon ambition by 2050. The initiative also aims to help at least six more cities prepare actions plans for ZCBs. Buildings are critical to achieving the Paris Agreement goals, where it is estimated that mitigation can more than double if energy efficiency is coupled with electricity supply decarbonisation (Figure 3).

⁸¹ Malaviya, Sumedh, WRI.

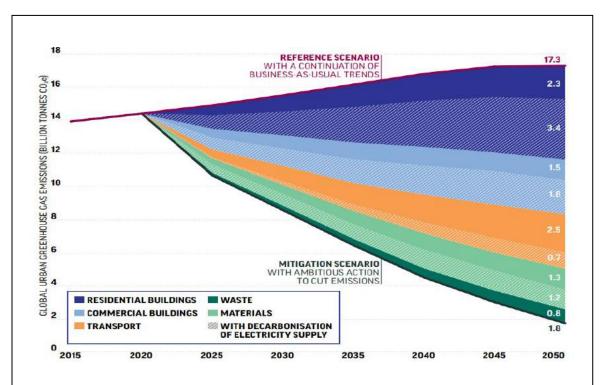


Figure 3: Role of buildings in achieving Paris goals (Source: WRI "Accelerating Building Efficiency: Eight Actions for Urban Leaders", adaptation of IPCC, "Climate Change 2007 – Mitigation of Climate Change")

Eight steps to achieving net ZCBs include: 1) implementing energy efficiency measures as the first priority; 2) reducing energy use with passive and climate-friendly cooling; 3) electrifying building space and water heating in advance of a cleaner grid; 4) applying digital controls and technology to optimize energy and demand; 5) engaging occupants and implement operational best practices; 6) meeting energy needs with on-site, local or purchased renewable energy; 7) reducing lifecycle emissions and embodied carbon of materials; and 8) compensating for residual carbon emissions with high quality offsets.⁸²

A key lesson learned from Mongolia is that the <u>enabling environment</u> is important to reducing heating and cooling demand of public buildings, e.g., by providing incentives for heat saving, increasing power tariffs, and building capacity of trusted contractors and public organizations.⁸³ The EU-financed Switch Asia project supports sustainable energy investments in the garment industry in Cambodia. GGGI, Geres, a development NGO, and the Garment Manufacturer Association of Cambodia (GMAC), are key partners in the project, which supports development of policy and regulations, monitoring and verification, factory assessments and training, as well as grant finance. Switch Asia is working with GMAC to develop a model green factory platform.

Scaling up efforts targeting the removal of technical, policy and financial barriers to adopting energy efficiency measures in different sectors and geographical contexts could have a major impact on the reduction of GHG emissions and help to accelerate the green transition globally.

⁸² ibid.

⁸³ Namkhainyam, Tsolmon, GGGI.

ACKNOWLEDGMENT

Speakers

- Dražen Kučan, Sector Lead/Senior Urban Development and Energy Efficiency Specialist, Green Climate Fund
- Rio Jon Piter Silitonga, Research Analyst, ASEAN Centre for Energy
- Dheeraj Arrabothu, Senior Officer Green Buildings, GGGI Rwanda
- Sumedha Malaviya, Program Manager, Energy Program, WRI India
- Tsolmon Namkhainyam, Energy Program Officer, GGGI Mongolia
- Brad Abbott, Project Lead Promotion of Sustainable Energy Practices in the Garment Sector, GGGI Cambodia

Moderator

• Christina Cheung, Green Cities Specialist, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-renewable-energy-energy-efficiency/.

13 Inclusive Green Growth: Partnership for Climate Resilient Urban Development

Agenda

16:00-16:05 (5 minutes)	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)		
16:05-16:10 (5 minutes)	Moderator's Welcome : Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development, GGGI		
16:10-16:15 (5 minutes)	Opening Remarks Rashidah Kamaluddin, Founder & Managing Director, KotaKita, Malaysia and UNICEF Youth Ambassador		
16:15-16:55 (40 minutes)	Panel I: Conceptualizing inclusive outcomes in green growth and climate action (Including Q&A)		
	Chair: Ingvild Solvang, Dep. Dir., Head of Climate Action and Inclusive Development, GGGI		
16:55-17:25 (30 minutes)	 Presenters: Opportunities and barriers to Inclusion in Green Growth, Ms. Bertha Chiudza, Senior Gender and Social Development Specialist, GGGI Investment Case for Child-Centred Climate Actions in the Context of Covid-19 in East Asia and Pacific, Ms. Seonmi Choi, Climate and Environment Advisor, UNICEF East Asia Pacific Regional Office How climate-smart development partnerships are empowering the world's poorest and most vulnerable, Mr. John Carstensen, Mott McDonalds Panel II: Metric for Sustainable and Inclusive Urban Development (Including Q&A) Chair: Nicholas Taylor, Adaptation and Urban Resilience Senior Specialist, GGGI 		
	 Presenters: Self-sustaining city: an answer to the world challenges, Mr. Tom Bosschaert, Director of Except Integrated Sustainability Navigating the Urban SDG Knowledge Platform: City Implementation of the SDGs and Localization of Urban Best Practices, Mr. Kevin Drouin, Program Officer, CityNet 		

17:25-17:55 (30 minutes)

Panel III: Governance Solutions and Knowledge Management to achieve the 1.5 degree goal (Including Q&A)

Chair: Ximena Aristizabal Clavijo, Article 6 Senior Officer, GGGI

Presenters:

- 1. Exploring Global Climate Governance Solutions, Maja Groff, Convenor, Climate Governance Commission, Global Challenges Foundation
- 2. Knowledge Sharing of GGKP to Build Back Better, In Woo Jung, Senior Knowledge Officer, Green Growth Knowledge Platform

17:55-18:00 (5 minutes)

Closing

Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development, GGGI

Summary

Cities play a central role in achieving the SDGs and the Paris Agreement. Promoting environmental sustainability, climate resilience and social equality in the urban context requires the appropriate policies, technological innovations, and finance.

Diverse communities are at the center of sustainable development. Climate activist Greta Thunberg shows that youth make an enthusiastic contribution to engendering change and should be provided with space to act. Pursuit of climate resilient urban development should take into account the interconnectedness of cities and regions. The new normal provides an opportunity to contest the old ways of doing things and to normalize positive new values and cultures.⁸⁴

Several institutions have been conceptualizing Inclusive Outcomes in Green Growth and Climate Action, with the overarching principle that inclusive green growth gives a central role to both the economy and environment, while focusing on people. It reduces poverty, inequality and exclusion that constrain both growth and environmental sustainability. Inclusive green growth is inhibited by factors that include social and political inertia, a lack of inclusive financing instruments – where debate on financing remains focused on the sources of fund rather than the benefits (UN, 2021) – the political economy of reform, and the inequitable impacts of COVID-19 with estimated nearly 100 million more people driven into extreme poverty (World Bank, 2021) and US\$3.7 trillion loss of workers' earnings and inequalities widening (Inegality.org, 2021; ILO, 2020; Oxfam, 2021). Greening growth should be tailored to the country context, involve inclusive decision making, and aim at reducing the cost of transition. Fair and just transition are crucial and the transition to a net-zero economy should ensure that the benefits of the zero-carbon and resilient economy are shared fairly. GGGI pursues inclusive outcomes in each of its programmatic solutions (Figure 1).⁸⁵

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⁸⁴ Kamaluddin, Rashidah, Kota Kita (Borneo, Malaysia).

⁸⁵ Chiudza, Bertha, GGGI

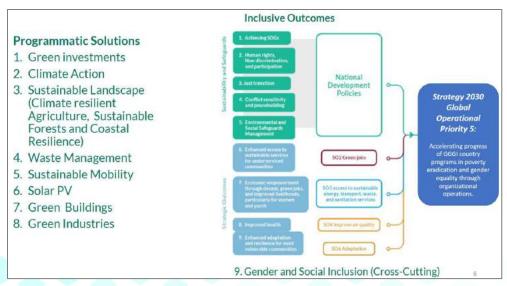


Figure 1: GGGI's Pathways towards Inclusive Green Growth (Source: GGGI)

The climate crisis is also a child rights crisis, with hundreds of millions of children exposed to heatwaves, water scarcity, air pollution, and cyclones. ⁸⁶ The negative impacts of COVID-19 risk reversing gains made on children's rights to health, nutrition, education and protection. There are investment opportunities in child-centered climate actions across several sectors in East Asia and the Pacific. Some 2.1 million youth jobs could be created by 2030 through child-centered climate actions, and more than 100,000 premature child deaths could be avoided annually with investment across a selection of countries targeting water and sanitation, air pollution, traffic fatalities, and mosquito-born diseases (Figure 2). ⁸⁷

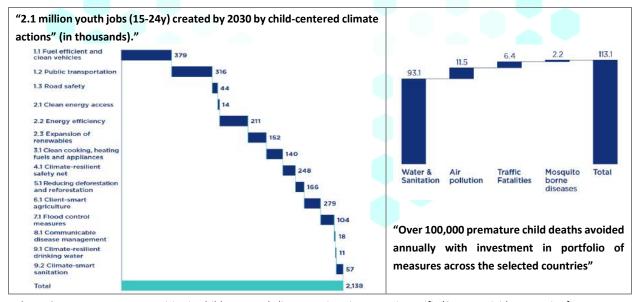


Figure 2: Investment opportunities in child-centered climate actions in East Asia Pacific (Source: Vivid Economics from UNICEF, 2021)

⁸⁶ UNICEF (2021), Children's Climate and Environmental Risk Index.

⁸⁷ Choi, Seon Mi, UNICEF.

Achieving transformational change requires addressing: 1) climate symptoms and events, 2) behavior and consumption, and 3) causes and systems. An example of the first is the Nepal Climate Change Support Programme Phase II, which supports adaptation planning and implementation. An example of the second is Business Partnerships for Global Goals, a program managed by Mott MacDonald that seeks to help one million people across Africa and Asia by supporting vulnerable workers and their families during COVID-19. An example of addressing causes and symptoms is the 2050 Calculator, an open, interactive energy model that helps users understand how to decarbonize a region or country, and to develop evidence-based policies. ⁸⁸

Some examples of Metrics for Sustainable and Inclusive Urban Development have been at different stages of development. An exciting futuristic urban model is Orchid City, a blueprint for a highly efficient, affordable, and sustainable city that reinvents how people can coexist and thrive with nature. The model calls for self-sufficiency in food production, energy supply, job creation, social services, and education programs. It is scalable from 500 to 50,000 inhabitants. The search is now underway for locations, funding, and partners to realize the first of these cities.⁸⁹

CityNet, the Seoul Metropolitan Government and UN ESCAP operate the Urban SDG Knowledge Platform, promotes knowledge sharing and city-to-city cooperation for sustainable urban development, and supports local action for SDG implementation, including up-take and replication of successful initiatives and good practices. The platform provides a repository of policies, initiatives and good practices at the city level, and links cities that have developed specific policies, initiatives and good practices with other cities interested in learning from and replicating them. ⁹⁰ Figure 3 presents a demonstration of SDG navigator.

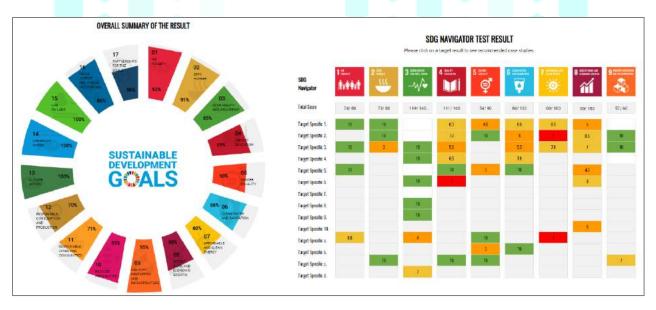


Figure 3: SGD Navigator demonstration (Source: CityNet/Urban SDG Knowledge Platform)

In term of Governance Solutions and Knowledge Management to Achieve the 1.5°C Goal, the context of Climate governance is characterized by a tension between universality and ambitious leadership, and a

⁸⁸ Carstensen, John, Mott MacDonald.

⁸⁹ Bosschaert, Tom, Except Integrated Sustainability.

⁹⁰ Drouin, Kevin, CityNet.

lack of coordinated action across policy areas. There is a need for increased coherence, upgraded institutions and international law, and a justice-oriented perspective. These issues are explored in the 2021 interim report of the Climate Governance Commission. The Green Growth Knowledge Partnership (GGKP) co-hosted by GGGI and its partners, is part of the solution to serve as a global community of policy, business, and finance professionals and organizations that collaboratively generate, manage, and share knowledge on the transition to an inclusive green economy. The partnership includes three knowledge platforms that provide access to research, case studies, guidance and tools for policy makers and advisors, SMEs, and financial institutions to make evidence-based decisions about how to green their operations.

In conclusion, progress toward the green transition will require inclusive and participatory approaches, partnerships, improved governance systems, and knowledge sharing. It is not sufficient to try and address the technical problems to be solved when addressing climate change. Efforts must begin with how to achieve the desired social outcomes, such as tackling poverty and inequality. Resilient cities will play a central role in achieving transformational change.

ACKNOWLEDGMENT

Speakers

- Bertha Chiudza, Senior Gender and Social Development Specialist, GGGI
- Seon Mi Choi, Climate and Environment Advisor, UNICEF East Asia Pacific Regional Office
- John Carstensen, Climate Change Lead (ISMA), Mott MacDonald
- Tom Bosschaert, Founder and Director, Except Integrated Sustainability
- Kevin Drouin, Program Officer, CityNet
- In Woo Jung, Senior Knowledge Management Officer, Green Growth Knowledge Partnership

Moderators

- Panel I: Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development, GGGI
- Panel II: Nicholas Taylor, Senior Officer Investment Policy Solutions, GGGI
- Panel III: Ximena Aristizabal Clavijo, Senior Officer, Program Manager, Designing Policy Approaches Under Article 6, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.

⁹¹ Climate Governance Commission (2021) Governing our Climate Future – Interim Report.

⁹² Jung, In Woo, GGKP.

14 Green Recovery Approaches and Innovative Finance for Developing and Emerging Economies

Agenda

17:00-17:05 Welcome Remarks, Introduction to Green Recovery and Session Overview

(5 minutes) H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green

Growth Institute (GGGI)

Ms. Diana Quezada, Senior Officer, Global Green Growth Institute (GGGI)

First Round Presentations

[Innovative approaches to drive green recovery through private sector engagement]

17:05-17:20 Presentation I: Greener and More Responsible Trade

(15 minutes)

Presenters:

Ms. Mehnaz Bhaur, Economic Development Lead: International Development Services, Business Partnerships for Global Goals BP4GG (Mott MacDonald)

Presentation II: Eco-inclusive Enterprises Driving Green Recovery

17:20-17:35 *Presenters*:

(15 minutes) Mr. Mirko Zurker, Head of Programmes SEED Partnership for Sustainability, Adelphi

Research gGmbh

17:35- 17:50 Presentation III: Government Green Recovery Approach working with the Private

(15 minutes) Sector

Presenters:

Ms. Nieva T. Natural, Director, Agriculture, Natural Resources and Environment, National Economic and Development Authority (NEDA) Government of Philippines

17:50-17:55 First Round Presentations - Q&A

(5 minutes)

17:55-18:00 Break

(5 minutes)

Second Round of Presentations

[Country Case Examples and Applied Research of Green Recovery]

18:00-18:15 Presentation II: The SDGs at the heart of the COVID-19 response and recovery

(15 minutes) plan in Burkina Faso

Presenters:

Dr. Charly Gatete, Thomas Sankara University, Institute of Initial and Continuous

Training (IUFIC)

Ms. Jocelyne Nadine Thiombiano, Researcher, Thomas Sankara University, Institute

of Initial and Continuous Training (IUFIC)

18:15-18:30 (15minutes)	Presentation IV: Post COVID and the triple crisis of debt, climate and nature: experience from West Africa	
	Presenters: Dr. Paul Steele, Chief Economist, International Institute for Environment and Development (IIED) Ms. Aida Diongue Niag, Deputy Country Representative, Policy Lead, Senegal Program, Global Green Growth Institute (GGGI)	
18:30-18:45 (15 minutes)	Presentation V: Putting nature at the heart of a green recovery: Global and country perspectives Presenters: Ms. Najma Mohamed, Policy Director, Green Economy Coalition Ms. Gitika Goswami, Senior Programme Director, Development Alternatives, India Ms. Marysol Goes, Amazon Green Economy Hub Convenor, Fundação Amazônia Sustentável, Brazil	
18:45- 18:50 (5 minutes)	Second Round Presentations - Q&A	
18:50- 19:00 (15 minutes)	Panelist Reflection of Key Take Away for Green Recovery & Closure	

Summary

Recovery from the Covid-19 crisis presents an extraordinary opportunity to address a triple crisis of debt distress, biodiversity loss, and climate change impacts in developing countries and emerging economies. Innovative approaches and financing mechanisms are being used to drive a successful green recovery, including engagement of small and medium sized enterprises (SMEs) and integration of natural capital investments into government plans and budgets.

Business Partnerships for Global Goals (BP4GG) is a UK Foreign, Commonwealth and Development Office program which invests in partnerships with businesses to test and scale shared value initiatives that support the SDGs. Managed by Mott MacDonald, the program hosts the Vulnerable Supply Chains Facility, a rapid Covid-19 response facility partnering with 20 international agricultural and garment product retailers, in eight partnerships projects across Africa and Asia. BP4GG targets affected workers, especially women, in Bangladesh, Ethiopia, Ghana, Kenya, Myanmar, Tanzania and Zimbabwe. To date, about 1.5 million people – more than half of them women – have benefited from the initiative.⁹³

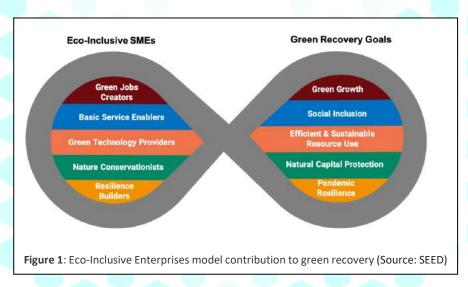
One of the projects tested the viability of shipping flowers from Kenya to Europe by sea instead of air, following curtailment of flights. Kenya's flower-growing industry was hard hit by the pandemic, and tens of thousands of workers lost their jobs. Working with Flamingo, a vertically integrated horticultural business, the Vulnerable Supply Chains Facility was able to save 18,000 jobs. Workers were trained to develop new packaging and protocols that will preserve fresh-cut flowers during a four-week sea voyage. Beyond the social benefits, this initiative substantially reduces the industry's carbon footprint. Elsewhere,

⁹³ Bhaur, Mehnaz, BP4GG.

about 7,000 cocoa farmers were involved in an income-diversification scheme designed to reduce growing climate risk faced by the farmers.

To bounce back from the Covid-19 crisis, workers in developing countries need additional help as well as support so they can build back greener. They need to be provided with the tools, skills and means to improve their lives in the context of climate change. Business partnerships have acted as a force for good delivering social, economic, and environmental outcomes.

Multiple country governments, donors and international bodies/platforms are prioritizing SMEs in their green recovery plans to accelerate a green and inclusive transition. SMEs are the backbone of economies worldwide, and green and social SMEs play an important role in delivering green recovery impact on the ground through their activities, products and services. SEED – a global partnership for action on sustainable development and the green economy – promotes Eco-Inclusive Enterprises model (Figure 1). These "eco-inclusive enterprises" are job creators and drivers of green growth; provide basic services to underserved communities; foster development of green innovation for sustainable consumption and production; protect, conserve, and restore natural ecosystems; and are resilient builders for the communities in which they operate.



During the pandemic, the Philippines updated the primary goal in its national development plan PDP 2017-2022⁹⁷ to be achievement of a "healthy and resilient" country. Green recovery and resilience strategies have been integrated throughout the plan in areas as diverse as governance, culture, human capital development, community safety, security and infrastructure development. Figures 2a and 2b present the updated PDP Framework and the enhanced Strategic Framework.

⁹⁴ To learn more about green recovery plans, see the Green Economy Tracker: https://greeneconomytracker.org/.

⁹⁵ SEED (2021) SEED Green Recovery Snapshot: Eco-Inclusive Enterprises Driving Green Recovery Pathways.

⁹⁶ Zuerker Mirko, SEED.

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⁹⁷ The updated Philippine Development Plan can be found here: https://pdp.neda.gov.ph/updated-pdp-2017-2022/.

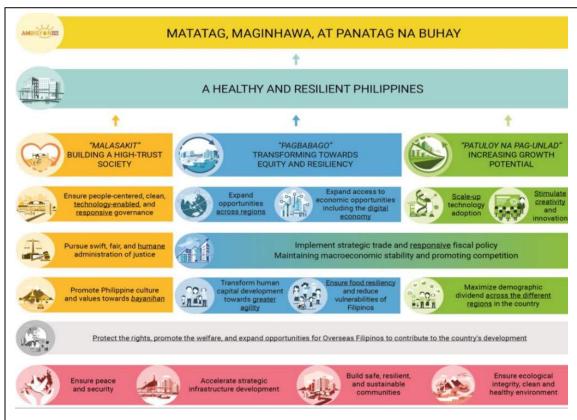


Figure 2a: Updated PDP Framework (Source: National Economic and Development Authorities, Government of the Philippines)

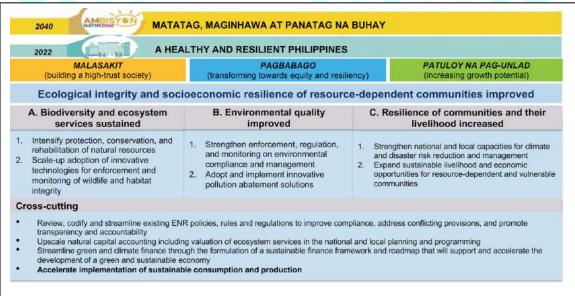


Figure 2b: Framework of improved Ecological integrity and socioeconomic resilience of resource-dependent communities (Source: National Economic and Development Authorities, Government of the Philippines)

Pandemic-response measures taken by the government of Burkina Faso respond to most of the SDGs. For example, the provision of food assistance to households and payment of water and electricity bills for the most vulnerable social groups relate directly to SDGs 1, 2, 6, 8 and 10, and indirectly to SDGs 3 and 10. During Covid-19, Burkina Faso has experienced the creation and strengthening of new local markets and green jobs, adoption of circular economy strategies by companies, a reduction in wasted resources, and improvements in sanitation.

IIED in collaboration with GGGI and other partners have performed scoping for possible debt deals for nature and climate to address the triple crisis of debt, biodiversity loss and climate change in coastal West Africa. Under debt instruments for climate and nature (Figure 3), a creditor allows the debt to be managed by conversation to local currency and/or be paid at a lower interest rate or be written off or lead to new bond issuance. Money generated is invested in climate resilience, renewable energy, and biodiversity protection. Key performance indicators for climate and nature are linked to Nationally Determined Contributions and National Biodiversity Strategies and Action Plans. Building on this initiative, debt for climate and nature deals are being prepared for Senegal and Cabo Verde by GGGI in collaboration with MAVA Foundation and the governments. Senegal has highlighted climate action, and nature conservation and restoration, in its national Covid-19 recovery plan as part of designing and operationalizing the Green Emerging Senegal Plan (PSE) where the approach and opportunities are illustrated on Figure 4.

What are debt instruments for climate and nature?

A creditor allows the **debt to be managed** by:

- Conversion to local currency and/or
- To be paid at lower interest rate or
- Some form of debt write-off
- New bond issuance

Money generated is invested in:

- Climate resilience
- Renewable energy
- Biodiversity protection



Figure 3: Debt instruments for climate and nature (Source: International Institute for Environment and Development)

⁹⁸ Steele, Paul, IIED.



More than half of the world's GDP is moderately or highly dependent on nature and its services. Governments should recognize that investing in natural capital brings economic benefits and drives social inclusion while providing societal benefits. They should also upscale eco-social policies and programs and

ensure that infrastructure investments and delivery adhere to environmental and social safeguards. 99

India's response to Covid-19 has included many green recovery initiatives, but further steps should be taken, such as strengthening natural capital positive schemes and implementing them across all states. There is also a need for strategic design and planning of policies prioritizing natural capital. Also, environmental regulations require strengthening, and analysis should be performed on ambiguous policies in order to develop clear recommendations for government.¹⁰⁰

Brazil's federal recovery plans do not feature net positive expenditures on natural capital in the Amazon. However, there is unprecedented support for at the *subnational* level for green recovery that recognizes that Brazil's future is tied to the Amazon. Nature-based Recovery Approach used for a recovery that works for People and Nature focuses on the need to invest in natural capital, link governments credit facilities to environmental conditionality, focus Government efforts on supports to sustainable small scale agriculture and not environmentally damaging agri-business and mining, and governments ensuring that infrastructure investments and delivery adheres to environmental and social safeguards. ¹⁰¹ The Nature-based Recovery identify nature-positive and nature-negative recovery investments and understand the processes that drives these economic decisions, in order to build the foundation for advocacy and draws general lessons and makes recommendations for how countries can sustain and conserve natural capital in COVID recovery.

⁹⁹ Mohamed, Najma, Green Economy Coalition.

¹⁰⁰ Goswami, Gitika, Development Alternatives, India.

¹⁰¹ Green Economic Coalition, IIED, Development Partners, Fundaçàa Amazônia Sustentàvel (FAS)

Many national responses to the COVID-19 crisis seek not only to reinvigorate economies and address the social impacts of the pandemic, but also to steer countries on to paths of inclusive, sustainable development. Actions are being taken to provide supportive policy, legal and regulatory frameworks, and financing mechanisms to drive green growth as the world emerges from the crisis. But not all developing countries have emphasized a green recovery in their policy and budgetary responses to the pandemic. Partnerships will be important to capitalize on synergies and create new opportunities for positive impact.

ACKNOWLEDGEMENT

Speakers

- Mehnaz Bhaur, Program Director, BP4GG
- Karen Smith, Business Partnerships/Agriculture Lead, BP4GG
- Raania Rizvi, Foreign, Commonwealth and Development Office, UK Government
- Isaya Muiru, Technical Manager/Senior Trainer, FlowerWatch
- Richard Fox, Director of Sustainability, Flamingo Horticulture, Ltd.
- Mirko Zuerker, Co-Lead Policy, SEED
- Nieva T. Natural, Director, Agriculture, National Resources and Environment, National Economic and Development Authority (NEDA), Philippines
- Jocelyne Nadine Thiombiano, University Institute of Initial and Continuous Training, Thomas Sankara University
- Paul Steele, Chief Economist, International Institute for Environment and Development (IIED)
- Aïda Diongue-Niang, Deputy Country Representative, GGGI Senegal
- Najma Mohamed, Policy Director, Green Economy Coalition
- Gitika Goswami, Senior Programme Director, Development Alternatives, India
- Marysol Goes, Amazon Green Economy Hub Convenor, Fundação Sustentável, Brazil

Moderator

Diana Quezada, Analyst, Office of Thought Leadership, GGGI Indonesia

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-entrepreneurship-green-jobs-green-recovery/.

15 The Evolution of Carbon Pricing Policies and Market Mechanisms

Agenda

11:00-11:04 (04 minutes)	Welcome Remarks and Introduction H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Ms. Fenella Aouane, Deputy Director - Head of Carbon Pricing Unit, Global Green Growth Institute (GGGI)	
11:04- 11:11 (07 minutes)	The Challenges of Carbon Tax Implementation in Indonesia Mr. Rusli Abdulah, INDEF (Institute for Development of Economics and Finance)	
11:11- 11:18 (07 minutes)	Lessons learned from CDM in the Caribbean Mr. Jongho Suh, UNFCCC Regional Collaboration Centre (Caribbean)	
11:18- 11:25 (07 minutes)	Optimal Auction Design in the Chinese National Carbon Emissions Trading System Mr. Daniel Yang, Department of Economics, Stanford University	
11:25-11:55 (30 minutes)	Panel Discussion / Q&A Moderator: Ms. Fenella Aouane, Deputy Director - Head of Carbon Pricing Unit, Global Green Growth Institute (GGGI)	
	Panelists: Ms. Ilona Millar, Baker McKenzie's Environmental Markets Practice Mr. Rusli Abdulah, INDEF (Institute for Development of Economics and Finance) Mr. Jongho Suh, UNFCCC RCC Caribbean Mr. Daniel Yang, Department of Economics, Stanford University	
11:55-12:00 (05 minutes)	Conclusion and Closing Ms. Fenella Aouane, Deputy Director - Head of Carbon Pricing Unit, Global Green Growth Institute (GGGI)	

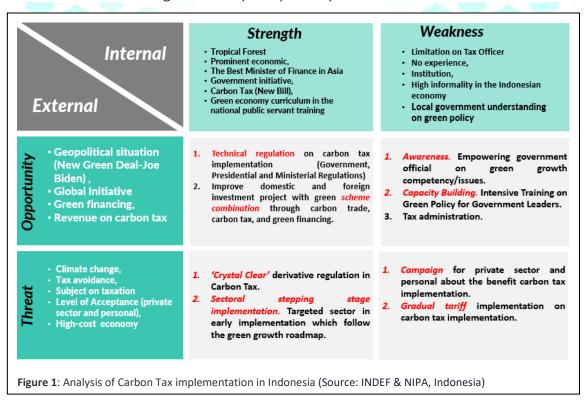
Summary

Carbon markets are viewed by many as an opportunity to lower the cost of reducing greenhouse gas emissions and enable countries to commit to more ambitious targets. Countries that struggle to meet their emissions reduction targets in their national climate plans, or want to pursue less expensive emissions cuts, can purchase emissions reductions from other nations that have cut their emissions more than the amount they had pledged, such as by moving to sources of low-carbon energy.

While the significant progress made on carbon market rules at COP 25 in Madrid stimulated the creation of emissions trading agreements between individual countries, countries were unable to

reach full agreement, and negotiations continue. Article 6 of the Paris Agreement seeks to establish rules to strengthen the integrity of carbon markets and create a new global carbon offsetting mechanism (At COP26, which took place after this session of GGGWeek 2021, delegates reached agreement on the "Paris Rulebook". This is addressed at the end of the technical summary paper).

In October 2021, Indonesia's parliament passed the harmonized taxation bill, which created the Harmonized Tax Law. The law creates a carbon tax, which will be imposed at a minimum of 30 rupiah (US\$0.002) per kilogram of CO₂ equivalent on coal-fired power plants from April 2022. The law mandates the creation of a roadmap to establish a national carbon trading mechanism by 2025, as well as a strategy to reduce Indonesia's greenhouse gas emissions. Implementation of the new law will require several actions, including adoption of a technical regulation, training on green growth for government officials, creation of a task force on green investment, and gradual tariff implementation.¹⁰² Figure 1 presents an overview of the analysis of Carbon Tax implementation in Indonesia to support the three-phase policy goals and recommendations: Phase 1 on regulations, awareness raising and training; Phase 2 on green investment, carbon trading and carbon tax/green financing; and Phase 3 on gradual implementation and widening sector beyond power plants.



The Clean Development Mechanism (CDM) allows a country with an emission-reduction or emission-limitation commitment under the Kyoto Protocol to implement an emission-reduction project in

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¹⁰² Abdulah, Rusli, INDEF.

developing countries. Such projects can earn saleable certified emission reduction (CER) credits, each equivalent to one tonne of CO₂, which can be counted towards meeting emissions reduction targets. The UNFCC's Regional Collaboration Centre in St. George's, Grenada spreads the benefits of CDM in the Caribbean, and supports developing countries' implementation of National Determined Contributions. It is one of six UNFCC Collaboration Centres operating around the world.¹⁰³

Sixty-five CDM projects from the Caribbean appear on the CDM website, but only 27 have passed through the registration process, and just eight have reached the stage of CER issuance. The Caribbean is less successful in creating CERs than other world regions. Lessons learned from the region are that small island developing states have only small potential for carbon reduction and limited human resources. Training is needed for local consultants, project developers and Designated National Authorities. At least two western European governments are providing support to Caribbean countries under Article 6.2 of the Paris Agreement, which allows Parties to use "internationally transferred mitigation outcomes" to achieve their mitigation targets. For example, Sweden is engaged in direct bilateral cooperation with the Dominican Republic, and Switzerland with Dominica. Areas of likely discussion at COP26 include Article 6.4, which creates a central UN mechanism to trade credits from emissions reductions generated through specific projects, and Article 6.8, which establishes a work program for non-market approaches, such as applying taxes to discourage emissions.¹⁰⁴

China has an emissions trading system (ETS) using rate-based tradable performance standards which target carbon intensity. The system applies only to the country's power/electricity sector and involves the free allocation of allowances to companies. The government imposes a benchmark for the sector for each firm to meet that is the optimal efficiency ratio for emissions to output. The rate-based Tradable Performance Standards (TPS) has only been in operation for a few months, but already weaknesses are discernible. These include potential misreporting by firms, price volatility, and low effective price. Research by Stanford University finds that switching to an auction-based ETS would yield allocative efficiency, price discovery, and price stability (Figure 2). More specifically, adoption of a simultaneous ascending clock may be advantageous for carbon permit markets in China. 105

¹⁰³ Suh, Jongho, UNFCC.

¹⁰⁴ Ibid.

¹⁰⁵ Yang, Daniel, Stanford University.

Category	Тур	e	
Sequence	Simultaneous	Sequential	Simultaneous
Price	Uniform	Discriminatory	Ascending Clock
Format	Sealed bid	Clock	may be an
Adv:		2. Discriminatory Price Sealed-bid Auction Adv: 1. High government revenue Dis: 1. Untruthful reporting 2. Disadvantages small bidders	advantageous format for carbo permit markets
Auction Adv: 1. Price disc 2. Rule simp 3. Efficient a 4. Truthful r Dis:	olicity and transparency allocation	4. Vickery Auction Adv: 1. Efficient allocation 2. Truthful reporting 3. High government revenue Dis: 1. Complex rules 2. Winner's curse	Auction choice ultimately depends on valu criterion and policy priorities

Australia has been involved in pricing carbon for almost two decades, and state of New South Wales introduced one of the world's first emissions trading schemes for the power sector in 2003. That scheme was replaced by a national carbon pricing mechanism in 2011, which itself was repealed in 2014 as it became politically divisive. Despite the repeal, a framework for carbon pricing remains, as does a registry that tracks the location and ownership of emissions units. Also, Australia's Carbon Farming Initiative (CFI) allows farmers and land managers to earn carbon credits by storing carbon or reducing greenhouse gas emissions on the land.¹⁰⁶

Taking a global perspective, there is no one-size-fits all approach to carbon pricing. There are variations among national circumstances, including the size of the economy and the capacity to implement particular schemes. Carbon pricing in Asia is key for cost-effective emission reductions and must play a major role in driving the transition to a climate-neutral economy. However, despite significant progress in wider climate policy uptake in recent years, the vast majority of greenhouse gas emissions in Asia remain unpriced. Several factors influence the adoption of carbon pricing.¹⁰⁷

For example, incumbent carbon-intensive industries may resist the introduction of carbon pricing through regulatory capture. The level of public support can make or break the success of a carbon pricing policy, particularly in jurisdictions where energy price increases are politically sensitive, where trust in government is low, or where there is general dissatisfaction with transparency and the perceived fairness of the instrument. Structural economic factors such as energy sector dynamics, the economic weight of carbon-intensive sectors, international trade flows, and labor market flexibility are among the key aspects that determine the probability of carbon pricing adoption and the instrument's stringency. Further, carbon pricing policies require technical capacity, such as the ability to monitor, report and verify emissions and to draft the technical guidelines and legislation that underlie these activities. ¹⁰⁸

¹⁰⁶ Millar, Ilona, Baker Mackenzie.

¹⁰⁷ Doda, Baran; William Acworth; Ernst Kuneman; Emma Krause; Anatole Boute; and Jackson Ewing (2021) Carbon Pricing Potential in East and South Asia, German Development Agency.108 Ibid.

Note: COP26 was held in Glasgow, Scotland, 31 October-12 November 2021. A key outcome was the conclusion of the Paris Rulebook. Negotiators were able to agree on technical and politically sensitive details left unresolved since 2015. The agreement on the fundamental norms related to Article 6 on carbon market will make the Paris Agreement fully operational. This will give certainty and predictability to both market and nonmarket approaches in support of mitigation as well as adaptation, and potentially unlock substantial amounts of new funding to accelerate the low-carbon economy.

ACKNOWLEDGEMENT

Speakers

- Rusli Abdulah, Researcher, INDEF (Indonesia)
- Jongho Suh, Associate Climate Specalist, UNFCC Regional Collaboration Centre St. George's
- Daniel Yang, Department of Economics, Stanford University
- Ilona Millar, Head, Global Climate Change Practice, Baker Mackenzie

Moderator

• Fenella Aouane, Deputy Director - Head of Carbon Pricing Unit, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.

16 Enhancing Countries' Direct Access to Climate Finance (Asia and the Pacific)

4 Agenda

13:00-13:05	Welcome Remarks		
(5 minutes)	Mr. Pa Ousman Jarju, Director (Country Programming), Green Climate Fund (GCF)		
13:05-13:45 (40 minutes)	Country Presentations		
,	 Papua New Guinea NDA: Climate Change and Development Authority Speaker: Mr. Ruel Yamuna, Acting Managing Director 		
	 Indonesia NDA: Fiscal Policy Agency, Ministry of Finance Speaker: Mr. Dudi Rulliadi, Senior Policy Analyst, Center for Climate Finance and Multilateral Policy 		
	3. Vanuatu Business Resilience Council Speaker: Mr. Glen Craig, Chairperson		
	4. Mongolia Green Finance Corporation (MGFC) Speaker: Mr. Bold Magvan, Chief Executive Officer		
13:45-13:55 (10 minutes)	Open Discussion/Q&A Facilitator: GCF/GGGI		
13:55-14:00 (5 minutes)	Closing Remarks Mr. Mahamadou Tounkara, Director (Office of the Director General), GGGI		

Summary

Direct access to the Green Climate Fund (GCF) is a key modality through which developing countries can mobilize resources for their climate priorities. The partnership between GCF and GGGI demonstrates how shared visions and goals can enhance the capacity of developing countries to access climate finance resources and contribute to the achievement of the Nationally Determined Contributions (NDC) and Sustainable Development Goals (SDG) targets.

GGGI and GCF maintain a strategic partnership on the implementation of the GCF Readiness Programme. In addition, GGGI supports National Designated Authorities and national Direct Access Entities in preparing projects for submission to GCF and to access Readiness Programme financing. Further, GGGI collaborates with partner governments to develop concept notes and funding proposals. Under the Readiness Programme, GGGI is implementing 19 grants worth US\$12.4 million in 11 Asia-Pacific countries¹⁰⁹. Overall, GGGI completed and ongoing Readiness Program of 41 projects in 26 countries for USD27.5 million globally include several countries in in Asia-Pacific region including Cambodia, Fiji, Indonesia, Lao PDR, Mongolia, Myanmar, the Philippines, Sri Lanka, Thailand, and Vanuatu, where GGGI

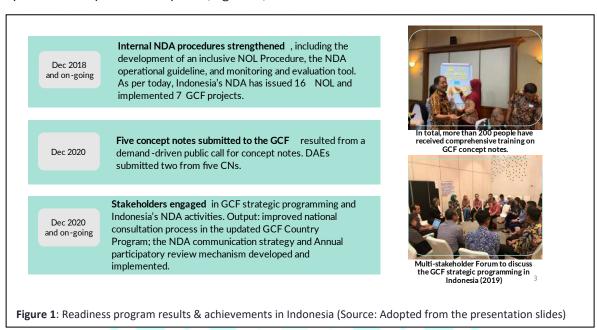
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¹⁰⁹ Jarju, Pa Ousman, GCF

is enhancing Vanuatu's ability to seek accreditation and direct access to the GCF. ¹¹⁰ The portfolio under preparation of 17 Programs in 16 countries for USD24.5 million also include serval Asia-Pacific countries.

In Indonesia for example, between 2018 and 2020, GGGI delivered a Readiness Support Programme to strengthen the National Designated Authority (NDA) capacity and the country's engagement with GCF. For the 2020-2022 period GGGI is currently delivering another project addressing country-specific barriers and gaps to mobilize international climate finance and private sector investments. ¹¹¹

Experience in Indonesia shows that continuous capacity development is required for the NDA, subnational governments, and Direct Access Entities. There are periodic consultations with technical ministries and accredited entities to monitor the project pipeline and update GCF project priorities. A climate finance focal point forum has helped to improve coordination on climate finance. Development of concept notes initiated by local project proponents can take more than a year before submission to GCF. It is recommended that environmental, social safeguards and gender-related requirements be emphasized in the simplified concept note template (Figure 1). ¹¹²



The Vanuatu Business Resilience Council (VBRC) was one of the first private sector organizations in the world to successfully apply for GCF Readiness Programme funding. It did so with the support of GGGl. Lessons learned from this experience include that it was important to use the official language (Bislama) in training sessions and workshops; maintain flexibility of topic and format to allow for feedback from trainings; formulate a common vision endorsed by stakeholders; and develop a project preparation unit to guide projects. In small island developing states like Vanuatu, there are very few private sector groups that have the capacity to tap into GCF funding. Existing rules in place are not fit for purpose. Simplifying paperwork requirements and the process would therefore be helpful (Figure 2).¹¹³

¹¹⁰ The latest GGGI GCF Portfolio Report can be found here: https://gggi.org/global-program/gggi-gcf-portfolio/.

¹¹¹ Rulliadi, Dudi.

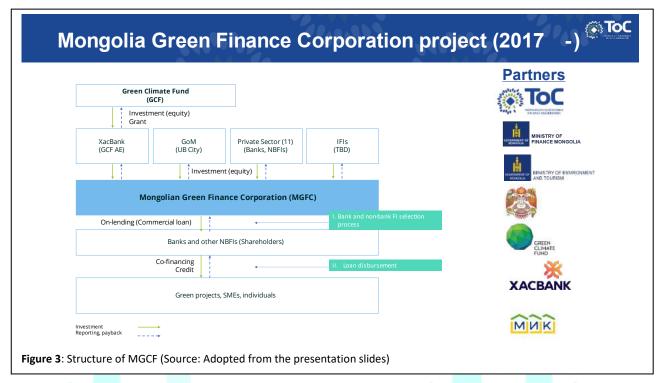
¹¹² Ibid.

¹¹³ Glen, Craig, VBRC.

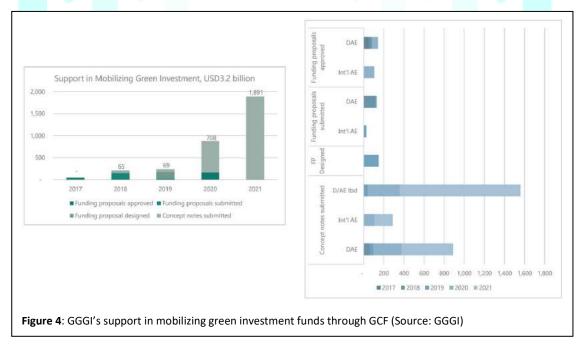


The Mongolian Green Finance Corporation (MGFC) is a public-private green financing vehicle that, beginning in 2022, will provide financing and capacity development in Mongolia. In 2017, GGGI collaborated with the Mongolian government and the Mongolian Sustainable Finance Association to implement GCF readiness activities geared toward the creation of the MGFC. Total capital of the new vehicle is US\$50 million, including \$27 million in loans, equity and grants from the GCF, \$18 million in loans and equity from the government, and \$5 million in equity from banks. Among the potential green projects identified with support of the Readiness Programme include Ger (residential) district housing insulation, and energy efficiency projects in the business and residential building sectors. Close cooperation between the private sector and government of Mongolia, and the international community, contributed to the steady progress from readiness activities to launch of the MGFC (Figure 3). ¹¹⁴

¹¹⁴ Magvan, Boldoo, MGFC.



GGGI and GCF have built a strong strategic partnership through the GCF Readiness Programme. The partnership has provided support to more than 30 governments to access direct financing from GCF (Figure 4). The experience of the country examples showcased in this session can be shared with other countries to learn how private sector, investors and governments can work with NDAs and accredited entities to deliver important achievements through the Readiness Programme. ¹¹⁵



¹¹⁵ Tounkara, Mahamadou.

ACKNOWLEDGMENT

Speakers

- Dudi Rulliadi, Senior Policy Analyst, Center for Climate Change Finance and Multilateral Policy, Fiscal Policy Agency, Ministry of Finance, Indonesia
- Glen Craig, Chair, Vanuatu Business Resilience Council (VBRC)
- Boldoo Magvan, Acting CEO, Mongolia Green Finance Corporation (MGFC)
- Julie Robles, Manager for Partnership and GCF Portfolio, GGGI
- Daniel Buckley, Manager, Readiness and Preparatory Support Programme, GCF.
- Pa Ousman Jarju, Director (Country Programming), Green Climate Fund
- Mahamadou Tounkara, Director (Office of the Director General), GGGI

Moderators

- Julie Robles, Manager for Partnership and GCF Portfolio, GGGI
- Daniel Buckley, Manager, Readiness and Preparatory Support Programme, GCF.

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.

17 Sustainable Landscape and Climate Smart Agriculture Solutions in Asia/Pacific

♣ Agenda

14:00-14:05 (5 minutes)	Welcoming remarks H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)		
14:05-14:15 (10 minutes)	GGGI's work in Peatland areas in Indonesia Marcel Silvius, Country Representative in Indonesia, Global Green Growth Institute (GGGI)		
14:15-14:25 (10 minutes)	Presentation I What Have We Learned from Designing Programs for REDD+ Results-Based Payments in Indonesia? Speakers: Tim Jessup (Green Growth Knowledge Leader) and Latifa Sitadevi (NDC Policy Advisor) Global Green Growth Institute (GGGI), Indonesia Program		
14:25-14:35 (10 minutes)	Presentation II New monitoring solutions for forestry, agriculture and climate change Speaker: Wilbert van Rooij, SarVision		
14:35-14:45 (10 minutes)	Presentation III Urban Forest an Ecosystem Service-based solution for pollution and congestion Speaker: Dr. Reazul Ahsan, The University of Utah Asia Campus		
14:45-14:55 (10 minutes)	Presentation IV Rimba Collective Program: Corporate Supply Chain Strategy to Reach Net-Zero by 2050 Speaker: Michal Zrust, Founder and Chief Sustainability Officer and Dedy Mahardika, Rimba Collective Program Officer, Lestari Capital		
14:55-15:05 (10 minutes)	Presentation V Sustainable Agriculture practices in India 2021: What We Know and How to Scale Up Speaker: Ms. Shanal Pradhan, Council on Energy, Environment and Water (CEEW)		
15:05-15:15 (10 minutes)	Presentation VI Agrivoltaic technology as a climate smart agriculture in SIDS Speaker: Jinsuk Kang, ENVELOPS CO., LTD.		
15:15-16:00 (45 minutes)	Panel Discussion and Q&A		

Summary

The land-use sector, including forestry and agriculture, have a key role to play in meeting Paris Agreement commitments through the sustainable development of land-based natural capital provided by forests, wetlands and other key ecosystems. Economies depend on these ecosystems. Forest and wetland degradation contributes over 25% of global GHG emissions. Containing global warming is impossible without turning forests and wetlands into a net carbon sink.

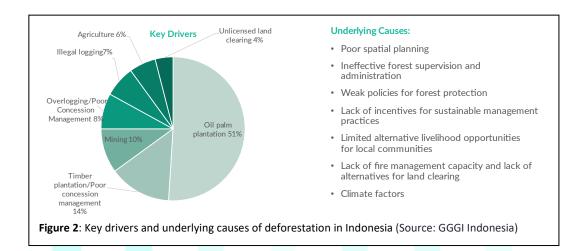
Indonesia is endowed with peatland ecosystems, which are rich in biodiversity. GGGI has provided strong support to the government's paradigm of rewetting, reforestation, and revitalization. Examples of GGGI support include Jambi Province Emission Reduction Program design for BioCF, a GCF proposal design for Berbak and Sembilang National Parks, and the establishment of Indonesia's first provincial Peatland Protection and Management Plan in Central Kalimantan. A jurisdictional enabling platform in Central Kalimantan has helped to mainstream green growth investments at the landscape level, and facilitated design, coordination and financing of larger bankable projects based on a common vision and joint monitoring, reporting and verification. The use of a a business-based and an inclusive community-based approach has contributed to the Restoration of fire-prone peatlands supported by buffer zones and business models for local enterprises and livelihoods. Figure 1 presents the Landscape-wide revitalization approach used by GGGI.



Over half of the province of Kalimantan, Indonesia's third largest province, is covered by forest. Local causes of deforestation include poor spatial planning, ineffective forest supervision and administration, a lack of incentives for sustainable management practices, and limited alternative livelihood opportunities for communities (Figure 2). The Forest Carbon Partnership Facility's Carbon Fund supported a REDD+ results-based payment program in East Kalimantan. Many other partners, including GGGI, and the central and provincial governments in Indonesia, were involved.¹¹⁷

¹¹⁶ Silvius, Marcel and Latifa Sitadevi, GGGI Indonesia.

¹¹⁷ Jessup, Timothy, GGGI Indonesia.



The program sought to address deforestation by including work components addressing forest and land governance, forest supervision and administration, reducing forest degradation in licensed areas, sustainable alternatives for communities, and program management, monitoring and evaluation. Forest and land use provide the greatest potential for emissions reduction in Indonesia (and at a low cost of mitigation). Results based payments (RBPs) programs provide a flexible approach very much under the control of the government responsible for implementation. They are also clear on outcomes and results. The main source of funding for the Kalimantan program came from the government of Indonesia through its national, provincial, district and village budgets by integrating the emission reduction program into development and investment plans. ¹¹⁸

Among the challenges in designing and establishing the initiative were coordinating the adjustment and responsibility of various levels of government and five main sectors for emissions reduction; the absence of certain technical regulations at the federal level; and the lack of a methodology for calculating benefits for beneficiaries and a benefit sharing mechanism. Table 1 presents the importance of RBPs in Indonesia.

Table 1: Importance of Results based payments in Indonesia

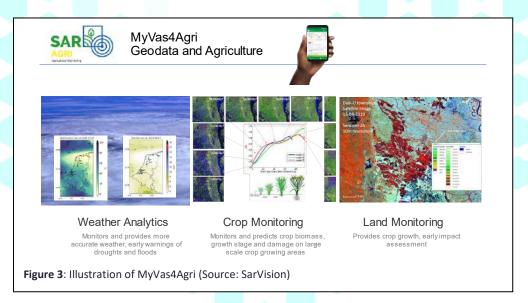
¹¹⁸ Ibid.

¹¹⁹ Ibid.

Sector	Potential Emission Reductions (MTon CO₂e)	Estimated Costs (US\$ billion)
Forest and Land Use	655	5.56
Energy and Transportation	398	236.2
Industrial Processes and Production Use	3.25	0.4
Waste	26	2.9
Agriculture	4	2.2
TOTAL	1,086.25	247.26

Source: Indonesia 2nd BUR

Among the modern tools for monitoring forestry, agriculture and climate change are radar and remote sensing systems. For example, a smartphone app (Sat4Rice) developed by the Dutch firm SARVision offers rice growth stage monitoring through satellite data, field data, and on-the- ground observation data. The data benefits small holder farmers in Vietnam's Mekong Delta. SARVision technology also provides real-time forest monitoring, as it is doing in Borneo, East Africa, the Colombian Amazon, and other locations. Figure 3 presents an illustration of MyVas4Agri for weather analytics, crop monitoring and land monitoring.



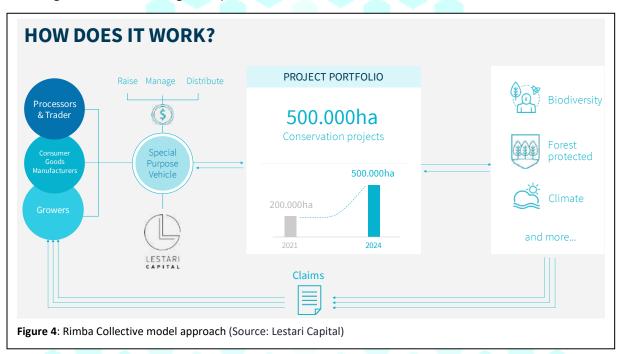
An ecosystem service-based solution for pollution and congestion is the urban forest, which encompasses the trees and shrubs in urban areas. Urban forests are a form of green infrastructure – the natural and semi-natural infrastructure within a city that provides ecosystem services like storm water management and air pollution abatement. Songdo International Business District in the Republic of Korea was built

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¹²⁰ van Rooij, Wilbert.

from scratch on 1,500 acres of reclaimed land. It includes extensive open and green space, and is the country's first LEED-certified city. 121

Rimba Collective is an initiative led by buyers and processors of palm oil to collectively support long-term sustainable conservation, and restoration of forests. It aims to provide \$1 billion to protect or restore 500,000 hectares of forest, supporting 32,000 in forest communities in Southeast Asia by 2024, beginning in Indonesia. Funding from partners is channeled to a portfolio of conservation projects. Costs are linked to procurement volumes, integrating Rimba Collective costs into operations procurement decisions. Contributions and contractual obligations flow directly from participants to a Special Purpose Vehicle which manages the funds. 122 Figure 4 presents how Rimba Collective model works.



The initiative supports multiple supply chain sustainability objectives. Examples include de-risking supply chains protection of frontier forests, protection of future forest conservation through incentivization of local communities and supporting industry-wide recovery or restoration efforts that contribute to compliance with "No Deforestation, No Peat, No Exploitation" (NDPE) policies. It also demonstrates progress against new conservation and restoration commitments, as well as compliance with requirements for hectare-based conservation support. The initiative also supports achievement of key SDGs and contributes to climate and carbon goals. ¹²³

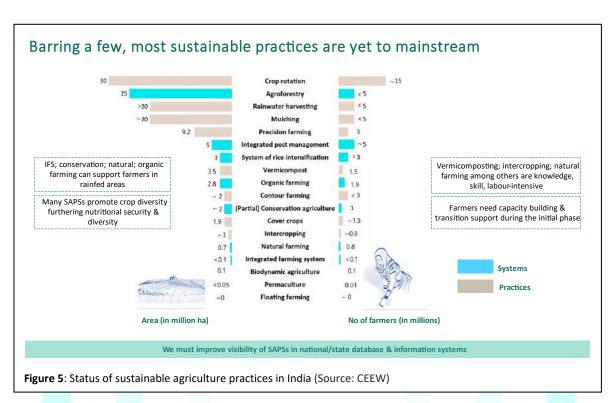
Sustainable agricultural practices have yet to be widely adopted in India, with the exception of crop rotation, agroforestry, rainwater harvesting, and mulching. Such practices are used in areas totalling at least 20 million hectares. An evidence-backed scale up of sustainable agriculture in India could begin with active promotion of sustainable agriculture in rain-fed areas. Other steps could include supporting

¹²¹ Ahsan, Reazul.

¹²² Zrust, Michal, Lestari Capital.

¹²³ Ibid.

knowledge exchange and capacity building for farmers, restructuring government support to incentivize outcomes rather than inputs, adopting short-term transition support for net losers, and supporting further evidence generation while scaling. Figure 5 presents the status of sustainable agriculture practices in India.



A 4MW agrivoltaic systems (APV) project, developed in Fiji by the Korean renewable energy project developer ENVELOPS, generates renewable energy and increases food security by utilizing land situated under solar panels. The system combines production of photovoltaic power and agricultural crops in the same area. A preliminary feasibility study is now being conducted on expanding the project to 16MW with support of the GCF and others. There is interest in replicating the APV approach in other Pacific island countries. Figures 6a and 6b illustrate the Agrivoltaics APV Model currently deployed and an the example of the Fiji 4MWp Agrivoltaic project in Ovalu.

¹²⁴ Pradhan Shanai, CEEW.

¹²⁵ Kang, Jinsuk, ENVELOPS.

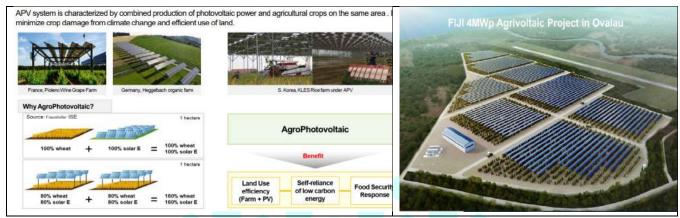


Figure 6a: Agrivoltaics APV Model

(Source: ENVELOPS)

Figure 6b: Fiji 4MWp Agrivoltaic project in Ovalu

Development of climate-smart approaches to land-management and agriculture, protecting against loss of biodiversity through conservation and restoration of healthy ecosystems, and utilizing monitoring technology for forests and agriculture, contribute to Asia's green transition.

Acknowledgment

Speakers

- Marcel Silvius, Country Representative, GGGI Indonesia
- Tim Jessup, Green Growth Specialist, GGGI Indonesia & Latifa Sitadevi, NPC Policy Advisor, GGGI Indonesia
- Wilbert van Rooij, General Manager, SarVision
- Reazul Ahsan, Assistant Professor & Urban Ecology Program Coordinator, University of Utah (Asia Campus)
- Michal Zrust, Founder, Director and Chief Sustainability Officer, Lestari Capital
- Shanai Pradhan, Council on Energy, Environment and Water (CEEW)
- Jinsuk Kang, Renewable Energy Project Manager, Envelops Co., Ltd.

Moderator

Marcel Silvius, Country Representative, GGGI Indonesia

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-climate-smart-agriculture-sustainable-landscape/.

18 Waste-2-Energy Potential to scale-up renewable energy access: Examples of Biofuels

Agenda

14:00-14:10 Inaugural Session

(10 minutes)

Welcome Remarks and Introduction to GGGI

 H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)

Special Address

 Dr. Jakob Williams Orberg, Counsellor for Innovation, Research and Higher Education, Royal Danish Embassy, New Delhi, India

Welcome address and launch of report entitled "Landscape Report of BioCNG in India" Dr. KyungNam Shin, Assistant Director General, Investment and Policy Solution Division, Global Green Growth Institute (GGGI)

14:10-14:20 Theme Setting - Overview of GGGI's BioCNG Initiatives in Asia

(10 minutes)

Mr. Nishant Bhardwaj, CoP Energy and Country Representative India, Global Green Growth Institute (GGGI)

14:20-15:00

Enabling Policies and Investment Ecosystem for Waste-2-Energy

(40 minutes)

Brief highlights of the programmatic, policy and regulatory initiatives undertaken to promote BioCNG ecosystem and investment opportunities in the country.

- Presentation 1: India Perspective
 Speaker: Mr. Anand Jha, Director, Ministry of Petroleum and Natural Gas,
 Government of India
- Presentation 2: Indonesia Perspective Speaker: Mrs. Andriah Feby Misna, Director Bioenergy, Ministry of Energy and Mineral Resources, Indonesia
- Presentation 3: Thailand Perspective

Speaker: Mr. Pajon Sriboonruang, President, Thai Biogas Trade Association,

Thailand

Q&A - *Moderator*: Mr. Nishant Bhardwaj, CoP Energy and Country Representative India, GGGI

15:00-15:20

Access to Public and Private Sector Finance for Waste-2-Energy Projects

(25 minutes)

Brief highlights on the various financing challenges and opportunities for Waste-2-Energy projects.

Presentation 1:

Challenges and opportunities in Waste-2-Energy project financing Speaker: Mr. Harshit Agrawal, Senior Gas Specialist, The World Bank

Presentation 2:

Waste-2-Energy project financing

Speaker: Mr. Gustaf Godenhielm, RE Power Group, Thailand

Q&A - *Moderator*: Mr. Nishant Bhardwaj, CoP Energy and Country Representative India, GGGI

15:20-15:55

Waste-2-Energy Technologies - Global perspective

(35 minutes)

Capturing the current technology landscape of Waste-2-Energy solutions (including scale of operation, key building blocks, flexibility to process variable feedstocks, and conversion efficiency).

Presentation 1:

Waste-2-Energy technology solutions and developments in India Speaker: Mr. Debadatta Mishra, AVP & Head BD (CBG), Praj Industries Limited, India

Presentation 2:

Waste-2-Energy technology solutions and projects implemented in Thailand Speaker: Dr. James Moran, Associate Professor, Chiang Mai University, Thailand

Presentation 3:

The Promotion of BioCNG application by the Biogas Purification Process of the Landfill Gas and Organic Waste locally *Speaker:* Mr. Djoko Budi Waluyo, Business Development Senior Staff, PT Nusatama Berkah, Indonesia

Q&A - *Moderator*: Mr. Nishant Bhardwaj, CoP Energy and Country Representative India, GGGI

15:55-16:00

Closing Remarks and Vote of Thanks

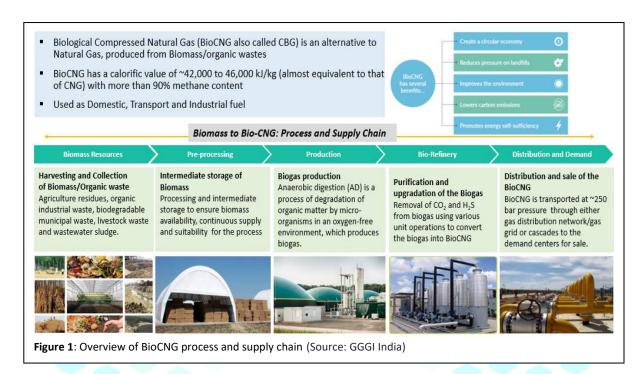
(05 minutes)

Dr. KyungNam Shin, Assistant Director General Investment and Policy Solution Division, Global Green Growth Institute (GGGI)

Summary

Biogas is a mixture of methane, CO₂ and small quantities of other gases produced by anaerobic digestion of organic matter in an oxygen-free environment. Biomethane (BioCNG) is a near-pure source of methane produced either by "upgrading" biogas (a process that removes any CO₂ and other contaminants present in the biogas) or through the gasification of solid biomass followed by methanation. Biogas and BioCNG are Waste-2-Energy products. Obstacles to greater production include the lack of appropriate business models and policy frameworks, institutional capacity, access to finance, and knowledge. Wastewater-2 energy (WW2E) projects capture methane and use it as an energy source. One dollar invested in WW2E projects reduce emissions by 0.3-0.4 ton, while cleaning 3,000 liters of wastewater. Figure 1 presents the overview BioCNG process and supply chain.

¹²⁶ Godenhielm Gustaf, RE Power Group, Thailand.



A new report¹²⁷ from GGGI highlights the huge potential of BioCNG in India, where about 62 million tonnes of BioCNG could be created from various sources. The government of India has created an enabling ecosystem for accelerated deployment of BioCNG projects through policy and regulatory provisions, and under the SATAT scheme (see below). Nonetheless, there are several challenges to BioCNG production in India that must be overcome. Broadly, these relate to technology, financing, implementation, market, and the quality of feedstock.

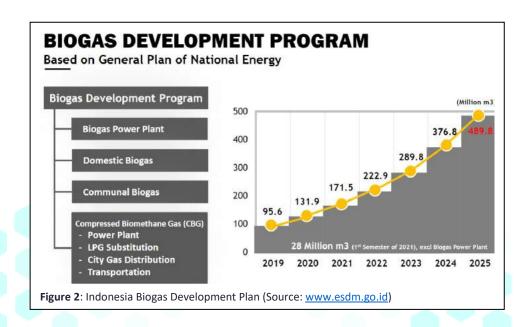
GGGI's BioCNG Program provides technical assistance to enable a supportive environment for the development of BioCNG in India, Indonesia and Thailand. It also aims to reduce policy and technological barriers and create localized sustainable and viable business models. In India, GGGI helps address organic waste availability, supply assurance, technology assessment, financial instruments, and risk management. In Thailand, GGGI assists the government in upgrading biogas 4-5 plants into BioCNG plants and supports vocational training for female engineering graduates. In Indonesia – where only 27% of the country's demand of 8 million tons of LPG is met through domestic production, and the rest of the demand is met through imported LPG valued at USD 2.9 billion – GGGI contributes to the improvement of raw material quality, and utilization of waste from the palm oil sector, livestock manure, and municipal solid waste as pipelines for BioCNG production.¹²⁸

Indonesia's General Plan of National Energy aims for direct utilization of biogas in the amount of 489.8 million m³ by 2025, up from 95.6 million m³ in 2019 (Figure 2). Challenges in expanding compressed biogas supply in the country include the substantial initial capital requirement for industrial scale development, few mill locations near city gas networks, a need for incentives, high investment cost to convert vehicles, and a lack of coordination and synergies among government ministries and agencies. ¹²⁹

¹²⁷ GGGI (October 2021) Landscape Analysis of BioCNG in India.

¹²⁸ Bhardwaj Nishant, GGGI.

¹²⁹ Misna, Andriah Feby, Ministry of Energy, Indonesia.



Also in Indonesia, a facility situated in East Kalimantan is producing BioCNG from palm oil mill effluent by means of a biogas purification process. BioCNG can substitute for LPG, especially for household consumption, and can also be sourced at sewage treatment plants and sanitary landfills. For example, urban sewage treatment plants could be modified for biogas extraction and equipped with BioCNG production facilities. BioCNG could be supplied to households in public apartments already equipped with gas piping systems and gas metering facilities. Different BioCNG production technologies provide options for promoting a circular bio-economy concept and creating new green jobs while contributing to climate change mitigation. ¹³⁰

India is committed to increasing the use of renewable energy, and there are plentiful supplies of raw material for BioCNG production (e.g., cattle dung and chicken litter, forest and agriculture residue, municipal solid waste, press mud, spent wash¹³¹, bagasse¹³², and prospective crops in barren, waste and single crop land). Compressed biogas projects utilize waste, reduce pollution, create local employment, reduce the country's fuel import bill, and promote indigenous technology, particularly in rural areas.¹³³

In October 2018, the Indian government launched the SATAT scheme to encourage entrepreneurs to set up compressed biogas (CBG) plants with offtake at a fixed price by oil and gas companies. The scheme also promotes greater use of agricultural residue, cattle dung, and solid waste (Figure 3).¹³⁴ A proposed World Bank program under preparation would provide \$265 million in support to SATAT by creating governance and institutional capacities for compressed biogas project development, and by financing compressed biogas production.¹³⁵ To date, however, only a small fraction of the 5,000 planned SATAT plants have been initiated.

¹³⁰Waluyo, Djoko Budi, PT Nusatama Berkah, Indonesia.

¹³¹ Residual liquid waste generated during alcohol production.

¹³² Dry pulpy fibrous material that remains after crushing sugarcane or sorghum stalks.

¹³³ Mishra, Debadatta, Praj Industries, India.

¹³⁴ Kumacha Anan, Ministry of Petroleum and Natural Gas, India.

¹³⁵ Agrawal, Harshit, World Bank.

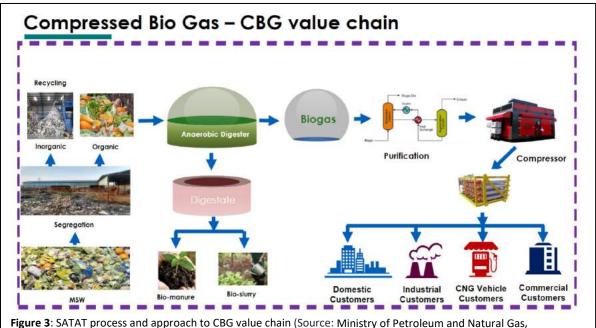
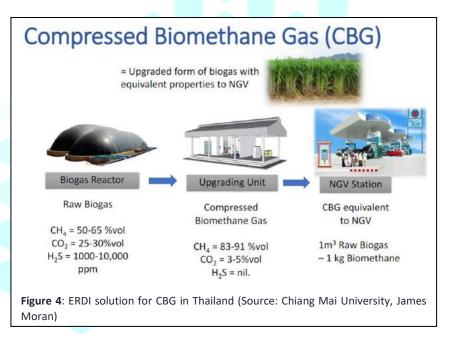


Figure 3: SATAT process and approach to CBG value chain (Source: Ministry of Petroleum and Natural Gas, Government of India)

Chiang Mai University has developed about 1.100 biogas systems in Thailand and in other countries, mainly using livestock waste in a channel digester process. BioCNG can be used in a local biomethane pipeline and be injected into a natural gas pipeline. It can replace LPG in cooking, and CNG in driving (Figure 4). 136 Thailand's Alternative Energy Development Plan seeks substantially scale up installed capacity of compressed biogas to the year 2037. The government intends to support the private sector in switching fuel use from coal and liquified petroleum gas to compressed biogas, LNG and biomass. 137



As shown by examples in India, Indonesia, and Thailand, there is great potential in Waste-2-Energy projects producing biogas and BioCNG in developing countries, thereby increasing the supply of

¹³⁶ Moran, James, Chiang Mai University, Thailand.

¹³⁷ Sriboonruang Pajon, Thai Biogas Energy Company.

renewable energy while contributing to decarbonizing of economies. Key to expanding biogas and BioCNG production are an enabling policy environment and investment ecosystem, access to public and private finance, and use of a range of available technologies.

Acknowledgement

Speakers

- Jakob Williams Ørberg, Counsellor, Innovation, Research and Higher Education, Royal Danish Embassy in Delhi, India.
- Kyung-Nam Shin, Assistant Director-General and Head of Investment & Policy Solutions Division, GGGI
- Nishant Bhardwaj, Country Representative, GGGI India
- Anan Kumacha, Deputy Secretary, Ministry of Petroleum and Natural Gas, India
- Andriah Feby Misna, Director, Bioenergy, Ministry of Energy, Indonesia.
- Pajon Sriboonruang, Chief Operating Officer, Thai Biogas Energy Company
- Harshit Agrawal, Senior Gas Specialist, World Bank
- Gustaf Godenhielm, Managing Director, RE Power Group, Thailand.
- Djoko Budi Waluyo, Business Development Division, PT Nusatama Berkah, Indonesia
- Debadatta Mishra, AVP & Head BD (CBG), Praj Industries, Ltd., Pune, India
- James Moran, Associate Professor, Chiang Mai University, Thailand

Moderators

- Nitesh Kumar, Senior Project Officer, GGGI India
- Nishant Bhardwaj, Country Representative, GGGI India

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-renewable-energy-energy-efficiency/.

19 Accelerating progress on Korea's Net Zero 2050 target

♣ Agenda	
15:00-15:05	 Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
15:05-15:10	 Introductory Speech Tong-Q Lee, Deputy Director-General, Ministry of Foreign Affairs, Republic of Korea Keynote speeches
15:10-15:20	 Role of Civil Society to achieve net zero 2050 (Video message) Young-Sook Yoo, Chair, Climate Change Center, and Former Environment Minister, Republic of Korea
15:20-16:30	Introduction to the Campaign for Blue Skies and Net Zero and the next steps • Frank Rijsberman, Director-General, GGGI
15:30-15:40	 Expectations for COP26 and progress toward the UK's net zero 2050 target Jonathan Woodland, Head, Climate Diplomacy, British Embassy Seoul
15:40-16:25	Panel Discussion
	 Chair: Ingvild Solvang, Deputy Director, Climate Action and Inclusive Development, GGGI Kerry Cheung, Director, Department of Energy, US Embassy Seoul Hoontae Kim, Director, ESG Committee, POSCO Soyoung Hwang, Head, ESG Planning Team, Shinhan Investment Corp. Sohee Kim, Secretary-General, Climate Change Center Yaewon Kim, Youth Representative, Usavers
16:25- 16:30	Closing

Summary

The government of the Republic of Korea (ROK) has set a target to reduce greenhouse gas emissions by 40% by 2030, below 2018 levels. (This was very recently increased from a target of 26.3%). The Framework Act on Carbon Neutrality and Green Growth enshrines carbon-neutrality by 2050 in law. However, these commitments are not sufficiently ambitious to steer the country onto a pathway compatible with the Paris Agreement's preferred global warming temperature target of 1.5°C. Figure 1 presents Korea's pathway to Carbon neutrality.



Figure 1: Korea's Progress and Commitments towards Carbon-Neutral Society (Source: Climate Change Center)

In July 2020, the ROK approved the Green New Deal to recover from the shocks of COVID-19 and to accelerate the country's response to climate change and transition to a low-carbon economy. The ROK was the 14th in the world to legislate carbon neutrality. Civil society can help to unify support and minimize social conflicts during a fair, inclusive transition to net zero, and advocate adoption of climate budgets by government and businesses.¹³⁸

The Blue Skies & Net Zero 2050 Campaign, launched in 2019 and its secretariat co-hosted by the Climate Change Center and GGGI, works to build public awareness about air pollution and the climate crisis; supports the SDGs and decisive action to achieve net zero by 2050; promotes collaboration among the government of the ROK, chambers of commerce, embassies in Seoul, civil society and international organizations to tackle climate change and air pollution; and supports development of ambitious NDCs to achieve a green recovery. The campaign is going international, building links between the ROK and other countries around efforts to promote green investments and the net zero objective.¹³⁹

Like the United Kingdom, the United States has ramped up its efforts to tackle climate change. President Biden organized the Leaders Summit on Climate Change and announced that the U.S. would reduce emissions 50-52% by 2030 as compared to 2005. In addition, he stated that the U.S. aims to achieve net zero by 2050. To reach these goals, the U.S. must marshal a whole of government effort, deploy clean energy solutions (and develop new ones), and engage with other countries and with all stakeholders in society. Both the United Kingdom and U.S. hail the leadership role played by ROK in addressing climate change. ¹⁴⁰

¹³⁸ Young-sook, Yoo, Climate Change Center, ROK.

¹³⁹ Young-sook, Yoo, Climate Change Center and Frank Rijsberman, GGGI.

¹⁴⁰ Cheug, Kerry, U.S. Embassy in Seoul.

The UK's Net Zero Strategy¹⁴¹, released in October 2021, sets out a comprehensive economy-wide plan for how British businesses and consumers will be supported in making the transition to clean energy and green technology – lowering the Britain's reliance on fossil fuels by investing in sustainable clean energy, reducing the risk of high and volatile prices in the future, and strengthening energy security. Highlights include improved energy efficiency of heating in households, 40GW of offshore wind and an end to sales of gas/diesel powered vehicles by 2030, a net zero grid by 2035, and a net zero railway network by 2050.¹⁴²

POSCO, the Korean steel-making company, has three focus areas of its low carbon strategy. The first is green process, which involves the development of low carbon technologies, such as increased use of scrap, CCUS, and hydrogen-based steelmaking. The second is green product, including the development and design of eco-friendly products, like electrical steel for high efficiency. The third is green partnership; POSCO participates in public-private partnerships to accelerate an industry-wide low carbon transition. Figure 2 presents the focus areas of POSCO's low carbon strategy.



As part of its 2030 "Zero Carbon Drive," the Seoul-based Shinhan Financial Group intends to reduce carbon emissions through measures such as creating a monitoring system and dashboard, setting carbon intensity limits for top CO2 emitters, establishing annual reduction targets, and refining the measurement of emissions and target management in line with global standards. It also intends to encourage expand green finance, set green finance goals, participate in global initiatives and alliances, and to encourage corporate customers to establish eco-friendly strategies and carbon reduction plans. ¹⁴⁴ In 2020, the Group's total output assets were 210 trillion Won, and Financial emissions estimated at 48.29 million

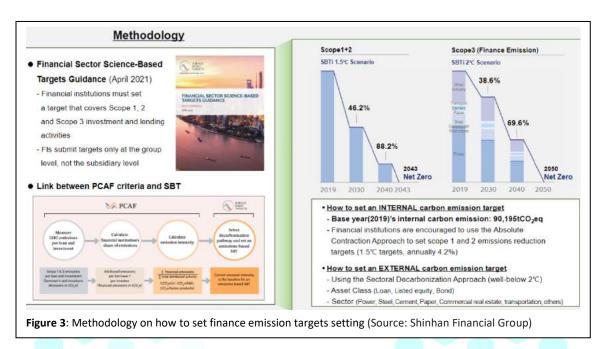
¹⁴¹ UK (October 2021) Net Zero Strategy, https://www.gov.uk/government/news/uks-path-to-net-zero-set-out-in-landmark-strategy.

¹⁴² Cheung, Kerry, U.S. Department of Energy/U.S. Embassy in Seoul.

¹⁴³ Kim, Huntae, POSCO.

¹⁴⁴ Hwang, Soyoung, Shinhan Financial Group.

tCO2eq. Figure 3 presents the methodology the Group uses for internal and external finance emission targets setting.



South Korean youth groups are educating themselves on climate change and environmental matters and developing their green leadership skills. They are also educating the public through social media. For example, last year, the youth organization U-Saver organized a debate forum about carbon neutrality and discussed forestry issues. It also organized climate change education for children. Youth can contribute to the green transition through the creation of start-ups, and communicating with political leaders.¹⁴⁵

Climate education that goes beyond textbook solutions will be critical to achieve ROK's emissions reduction goals. It should empower citizens of all generations to seek their own ideas and solutions to reach net zero. Institutes and organizations providing lifelong education in carbon neutrality are needed.¹⁴⁶

The ROK has made great strides toward greening the economy, but much work remains. Contributions from the private sector and civil society, including youth activists, will be needed for the country to achieve current commitments and greater ambition.

¹⁴⁵ Kim, Yewon, University Student.

¹⁴⁶ Kim, Sohee, Climate Change Center.

ACKNOWLEDGEMENT

Speakers

- Yoo Young-sook, Chair, Climate Change Center, ROK
- Frank Rijsberman, Director General, GGGI
- Jonathan Woodland, Head of Climate Diplomacy, British Embassy Seoul
- Kerry Cheung, U.S. Department of Energy/Energy Attaché, U.S. Embassy in Seoul
- Huntai Kim, POSCO, ROK
- Soyoung Hwang, Head of ESG Planning Team, Shinhan Financial Group, ROK
- Yewon Kim, University Student and Activist U-Saver
- Kim Sohee, Secretary General, Climate Change Center

Moderator

• Ingvild Solvang, Deputy Director & Head, Climate Action and Inclusive Development Unit, Investment and Policy Solutions Division, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-other-themes/.

20 Greenpreneurs Global Program 2021 Edition

Agenda

16:00:16:05- (5 minutes)	Opening & Welcoming remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Ms. Helen Watts, Director of Innovation and Partnerships, Student Energy (SE) Ms. Pragya Dawadi, Program Manager, Youth Climate Lab (YCL)
16:05-16:30 (25 minutes)	Business pitches from the 6 Greenpreneur teams Moderated by Mr. Hakku Bang, Results Reporting Officer, GGGI 6 Greenpreneurs finalists
16:30-16:50 (20 minutes)	Questions from judges to Greenpreneur teams Dr. Frank Rijsberman (GGGI), Mr. Juhern Kim (GGGI), Dr. Achala Abeysinghe (GGGI), Mr. Kakembo Galabuzi Brian, Ms. Raissa Espiritu
16:50-17:00 10 minutes)	Greenpreneur initiatives Title: Greenpreneur activities in GGGI – Current and Pipeline Ms. Stella Seung-Yeon Lee, Senior Green Investment Specialist, GGGI Mr. Juan Pablo Caballero, Senior Officer, Latin America and Caribbean, GGGI
17:00~	Announcement of the winners of the 2021 Global Greenpreneurs Program and Closing Remarks Dr. Frank Rijsberman, GGGI

Session overview

This event will provide an overview of GGGI's work within green innovation, including Greenpreneurs, country programs, and discuss current gaps and challenges for green startups in developing countries, highlighting the support needed to help startups get off the ground and scale up. This event will serve as an opportunity to award the winners of Greenpreneurs competition program as well as generate interest and funding opportunities for GGGI to support the entrepreneur ecosystem in its Members.

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-entrepreneurship-green-jobs-green-recovery/.

21 Closing the Loop: Circularity in the Built-Environment

Agenda

16:00-16:10 (10 minutes)	Welcome Remarks and Introduction of Session (pre-recorded) Mr. Ban Ki Moon, President-Chair, Global Green Growth Institute (GGGI)	
16:10-16:40 (30 minutes)	Setting the scene: One Planet Network Circularity in the Built Environment Report	
	Moderator: Mr. Nicholas Taylor, GGGI Presenters: Mr. Pekka Houvila, Green Building Council Finland Prof Usha Iyer-Raniga, RMIT	
	Riya Malhotra,TERI Yatin Choudhary, TERI Christina Cheong, GGGI	
16:40-17:30 (50 minutes)	Panel Presentation & Discussion: Circular solutions in the Built Environment (including $Q\&A$)	
	Moderator: Christina Cheong, Lead, Green Buildings, GGGI	
	Panelists: Green Road Waste Management Pvt. Ltd – Simple Solutions to manage Non-recyclable plastic wastes: Case of substituting the plastics in place of bitumen in road construction	
	Enpro Envirotech Pty Ltd – Circular economy with reduced carbon footprint in the Greenhouse Industry	
	GreenA Consultants Pte Ltd – Learning from the Past and Hoping for the Future: Decarbonising Buildings, Attaining Wellness and Managing Waste in our Environment	
17:30-17:40 (10 minutes)	Closing	
(10 mmates)	Mr. Steve Morris, Close the Loop Ltd.	

Summary

The built environment is the human-constructed environment that provides the setting for human activity. It operates in a linear way, consuming a large share of the world's extracted resources. We need to create a circular built environment (CBE) that is designed and implemented to close resource loops and operate in a sustainable fashion.

In Asia region where about 60% of the world's population resides, research carried out by the One Planet Network in several Asian countries identified numerous barriers to making the built environment more sustainable. These include limited mechanisms to incentivize supply-side stakeholders, such as manufacturers, distributors, dealers, raw material suppliers, wholesalers and "deconstruction" companies. Other supply side barriers include unavailability of Environmental Product Declarations, Life Cycle Assessments, and material passports, and issues regarding technology accreditation and validation. The region accounts for Construction and buildings sector accounts for approximately 27% of total final energy use regionally and contributes nearly 24% to energy-and process-related annual GHG emissions in 2018.

Among Asian facilitators, e.g., governments, financial institutions and developers, there has been little focus on water footprint, no incentives for waste reduction, a lack of education on circular thinking, low investment in nature-based solutions, and an absence of a robust measurement, verification and reporting framework around policies. Demand side barriers among consumers include a reluctance to buy used products or materials, and a lack of understanding of technology. Figure 1 present a diagram of flow of material, interventions and role of stakeholders in the built environment.

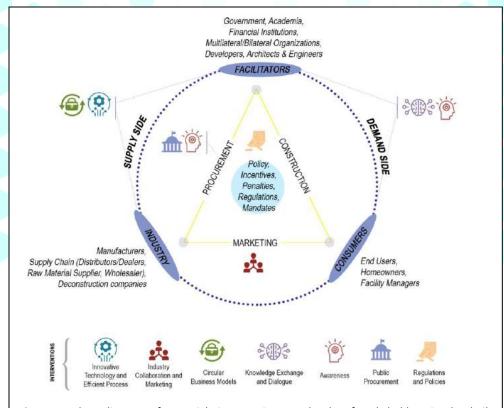


Figure 1: Flow diagram of material, interventions, and role of stakeholders in the built environment (Source: One Planet Network)

One Planet also examined the context for CBE in several African and Latin American countries. In Africa, barriers include poor control of building standards and construction processes; low technical capacity

¹⁴⁷Malhotra, Riya, TERI.

¹⁴⁸ Share of buildings final energy and GHG emissions in ASEAN, China and India in 2018 (Global ABC/IEA/UNEP)

¹⁴⁹ Ibid.

within the industry; a lack of standardization and certification facilities; poor regulation of waste management; time-consuming and costly deconstruction; and inadequate finance for circularity. On a brighter note, there exist facilitators like an abundance of local resources; informal networks of material circularity; and multiple channels for knowledge and technology transfer.¹⁵⁰

Developing CBE in Latin America demands a systemic approach that addresses not only resource efficiency, but also biodiversity protection, climate resilience, and social equity. It is also important to consider every scale of the built environment from materials and components to buildings, public spaces, infrastructure, neighborhoods, metropolitan areas, and regions under a life cycle approach. Areas for action include policy and regulatory harmonization, increased investment in R&D, expanding demonstration projects, and strengthening financing mechanisms.¹⁵¹

Despite the many barriers to CBE, many cases studies of good practice can be found in all three global regions across the building life cycle – manufacture, design, build, operation, renovation, and deconstruction.

Nepal grapples with growing plastic waste in landfills, and faces the challenge of improving its inadequate transport infrastructure. These issues are being addressed at the same time through the use of non-recyclable plastic waste in place of bitumen during road construction. Green Road Waste Management Pvt. Ltd brings simple solutions to manage non-recyclable plastic waste by substituting the plastics in place of building and road construction materials. The innovation, adapted from India, also reduces cost for road maintenance, and doubles the lifespan of roads. As shown in other developing countries, plastics can also be turned into bricks for construction purposes. Examples of green roads in Nepal include 1,200 Sq.m plastic road in Kirtipur and a 100 meter long and 6 meter wide plastic road in Pokhara to demonstrate that the solution works. Figure 2 present the climate benefits of the plastic road solution.



¹⁵⁰ Cheong, Christina, GGGI.

¹⁵¹ Huovila, Pekka, Ministry of Environment, Finland.

¹⁵² Bastola, Bimal, Green Road Waste Management, Nepal.

Circularity has also come to greenhouses, where plastic string is typically used to hold up vegetables that grow vertically. A demonstration project has shown that the plastic can be replaced by jute, which is cost effective, sufficiently strong, biodegradable, and compostable.¹⁵³

Construction of office buildings should ensure the well-being of occupants by giving attention to air, water, nourishment, thermal comfort, sound, materials, movement, light, and mind. During Covid-19, the work-life balance for many workers has gotten worse. In addition to promoting wellness, attention should be given to managing waste and decarbonizing. We should not limit ourselves to using modern technologies, as traditional natural materials like bamboo, rammed earth, and sandstone can help to reduce energy consumption and provide thermal comfort.¹⁵⁴

Adopting CBE practices will contribute to the green transition. Innovative approaches and demonstration projects can be adapted for use in other countries. Knowledge-sharing, collaboration, standardization, education, finance and supportive policies will all be important to accelerating progress in this area.

ACKNOWLEDGEMENT

Speakers

- Usha Iyer-Raniga, Professor, School of Property, Construction & Project Management, RMIT University
- Riya Malhotra, Project Associate, TERI
- Christina Cheong, Green Cities Specialist/Green Buildings Lead, GGGI
- Pekka Huovila, Program Coordinator, Ministry of Environment, Finland
- Bimal Bastola, Co-Founder, Green Road Waste Management, Nepal
- Jayant Keskar, Founding Director and CEO, Enpro Envirotech, Australia
- Lena Toh, Business Sustainability Analyst, TRUE Advisor (Waste & Sustainability), Green A Consultants, Singapore & Omar Elrawy, Partner, Energy & Sustainability, Living Future Ambassador, LEED AP, GreenA Consultants

Moderators

- Nicholas Taylor, Senior Officer, Investment and Policy Solutions, GGGI
- Christina Cheong, Green Cities Specialist/Green Buildings Lead, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-building-green-cities/.

¹⁵³ Keskar, Jayant, Envirotech, Australia.

¹⁵⁴ Toh, Lena and Omar Elwary, GreenA Consultants, Singapore.

22 Long-term strategies, NDCs, and BTRs: Tools and Lessons for 2050 net-zero

	Agenda
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17:00-17:05 (05 minutes)	Welcome Remarks, NDCs Siddhartha Nauduri, Global Lead, Climate Change MRV Systems, GGGI
17:05-17:15 (10 minutes)	Reporting under the Enhanced Transparency Framework Tugba Icmeli, Program Officer, UNFCCC
17:15-17:25 (10 minutes)	Enhancing Lao PDR's NDC and Committing to Net Zero Rowan Fraser, Country Representative, Lao PDR, GGGI
17:25-17:35 (10 minutes)	Transformational Integration of Electric Mobility Initiative with Members NDCs: GGGI Member NDCs Analyses and Cases Changsun Jang, Lead in Transport and Sustainable Mobility, GGGI
17:35-17:45 (10 minutes)	LT LEDS, the tools and systems Shivenes Shammugam, Senior Economic Officer, Macroeconomic Analysis of Low Carbon Development, GGGI
17:45-17:50 (05 minutes)	Intro & Video Overview 2050 Calculator Program Dr Brendan Donegan, Program Lead, 2050 Calculator Program, UK BEIS
17:50-18:00 (10 minutes)	Live demonstration of the 2050 Calculator Jonny McCormack, Project Manager, Mott MacDonald
18:00-18:10 (10 minutes)	How the UK used the 2050 Calculator and why it is rolling it out to other countries Isabelle Hillson, <i>Programme Officer</i> , UK BEIS
18:10-18:20 (10 minutes)	Country 1 Experience – Nigeria Mohammed Jafar Ladan, Energy Analyst and Senior Scientific Officer, Energy Commission of Nigeria
18:20-18:30 (10 minutes)	Country 2 Experience - Vietnam Nguyen Quoc Khanh, Team Leader, Vietnam 2050 Calculator
18:30-18:35 (05 minutes)	Youth Voice, Zulfiya Khazhina, Intern, GGGI

18:35-18:55 Question and answers and open discussion forum

(20 minutes)

18:55-19:00 Closing

(05 minutes) Siddhartha Nauduri

Summary

Long-term strategies are needed to mitigate global carbon emissions. These strategies must be implemented through Nationally Determined Contributions (NDCs) that will be reported within the Enhanced Transparency Framework (ETF). ¹⁵⁵ The ETF was created by the Paris Agreement to build mutual trust and confidence, and to promote effective implementation of the Agreement. The ETF builds enhances existing measurement, reporting, and verification (MRV) arrangements under the UN Framework Convention on Climate Change. It has a flexible structure that accounts for the Parties' different capacities and builds upon collective experience.

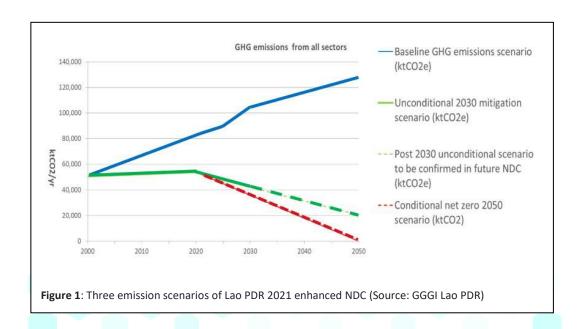
The ETF provides a clear understandings of climate change action, including clarity and tracking of progress toward achieving Parties' individual NDCs and adaptation actions. Key ETF features include common modalities, procedures, and guidelines for all parties; flexibility for developing country Parties that need it due to capacity limitations; enhancement of existing transparency arrangements; and facilitation for continuous improvement. The transition from current MRV practice and reporting to the ETF will take place in stages through 2024.¹⁵⁶

GGGI, the UK government, and various intergovernmental organizations provided support to the government of the Lao People's Democratic Republic (Lao PDR) to raise the ambition of its 2015 NDC with three emission scenarios (Figure 1). Key enhancements included the introduction of three emissions scenarios; updating and extending mitigation and adaptation targets; increasing transparency and consistency; strengthening MRV; and conditionally committing to Net Zero by 2050 (Lao PDR is one of only a few least developed countries to commit to Net Zero). The unconditional mitigation target for 2030 is a 60% reduction in emissions as compared to 2000, based on action in forestry, hydropower, energy efficiency, and transport. Figure 1 present the three emission scenarios of Lao PDR 2021 enhanced NDC.

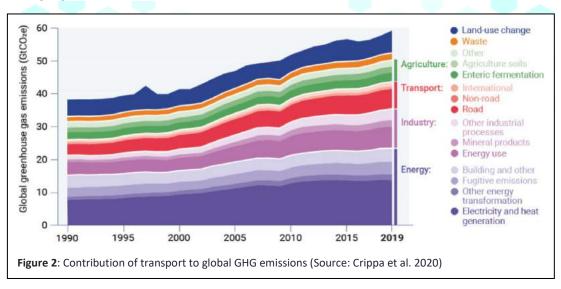
¹⁵⁵ UNFCC, Operationalization of the Enhanced Transparency Framework: https://unfccc.int/enhanced-transparency-framework

¹⁵⁶ Icmeli, Togba, UNFCCC.

¹⁵⁷ Fraser, Rowan, GGGI.

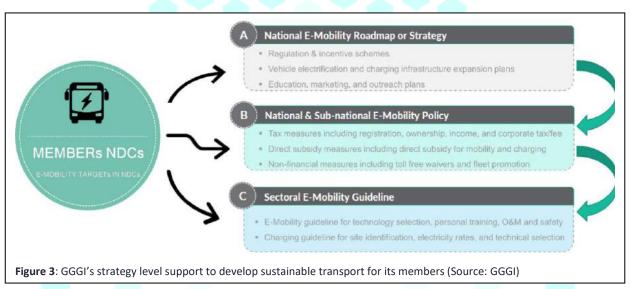


The transport sector has contributed around 14% of greenhouse gas (GHG) emissions over the last decade, mostly due to road transport (Figure 2). Some 86% of 140 NDCs identify transport as an important source of GHG emissions, while 65% define mitigation actions, with an emphasis on fuels and vehicles, urban transport, and infrastructure. About one-third of GGGI members include electrification of transport as a target in their NDCs. To increase attention given to e-mobility in NDCs, NDC targets must be connected more closely with long-term decarbonization targets and policies. Ambitious targets would send a strong signal to industry and citizens. ¹⁵⁸



¹⁵⁸ Jang, Changsun, GGGI.

The assessment of NDCs from 39 GGGI Members (44 countries and states) shows that 82% have transport mitigation targets in their NDCs, while 34% have e-mobility targets set. Challenges to expanding e-mobility among GGGI members include lack of e-mobility data, lack of accordance with sector strategies, and insufficient institutional capacity. To address these challenges in its members, GGGI has supported institutional development, and served as an enabler and facilitator, providing technical support in the development of e-mobility projects and programs, mobilizing green investment, and implementing e-mobility projects and programs.¹⁵⁹ GGGI's approach to connect NDC targets more closely with long-term decarbonization targets and policies (Figure 3) is crucial to accelerate the adoption and scaling up of sustainable transport.



Long-term low GHG emission development strategies (LT-LEDS) provide the necessary direction for enhancement of NDCs. They reinforce actionable, achievable, and ambitious NDCs. At the same time, ambitious NDCs contribute to follow through and actualize LT-LEDS. These synergies are crucial to ensuring a coherent framework for implementation of the Paris Agreement. Drawing upon a range of tools, GGGI helps members to align NDCs with LT-LEDS. For example, in Fiji, the LTS-LEDS use the same baseline data as the country's 2017 NDC Roadmap. In Ethiopia, the same cross-sectoral model that was used to develop NDC scenarios is used to derive the LT-LEDS scenarios. ¹⁶⁰

The 2050 Calculator energy modelling concept was developed by the UK Government to support its emissions target set in 2008. ¹⁶¹ This concept has been shared with nine countries, which have been developing their own versions to explore low-carbon pathways. The Calculator includes all energy and all emissions, is easy to use, and is published online with all assumptions targeted. Nigeria's 2050 Calculator can be used in the development of the country's next energy policy, inform stakeholders of renewable energy pathways, and guide development of energy transition masterplans. Vietnam's 2050 Calculator supports the Ministry of Industry and Trade in preparing and implementing actions plans to achieve NDC targets in the energy sector. ¹⁶²

¹⁵⁹ Ibid.

¹⁶⁰ Shammugam, Shivenes, GGGI.

www.imperial.ac.uk/2050-calculator

¹⁶² From session presentations on UK assistance to the development of 2050 Calculators in developing countries.

The climate crisis is as acute as any previous threat to humanity. The current round of NDC enhancement comes at a crucial time, following some of the hottest years ever recorded on the planet. COP26 is a turning point for solving the climate crisis. We have been slow to act and have limited time to cut emissions in half by 2030 and achieve Net Zero by 2050. Although many feel powerless, no one is too small to make a change. Young people should play a more active role in the fight against climate change. ¹⁶³

Ambitious climate targets, alignment of NDCs and LT-LEDS, energy modelling, and transparent monitoring of country progress in decarbonizing the economy contribute to the green transition.

ACKNOWLEDGEMENTS

Speakers

- Tugba Icmeli, Program Officer, UNFCCC
- Rowan Fraser, Country Representative, GGGI Lao PDR
- Changsun Jang, Lead in Transport and Sustainable Mobility, GGGI
- Shivenes Shammugam, Senior Economist, Macroeconomic Analysis of Low Carbon Development, GGGI
- Brendan Donegan and Isabelle Hillson, UK BEIS
- Jonny McCormack, Mott MacDonald
- Mohammad Ja'afar Landan, Nigeria 2050 Calculator
- Nguyen Quoc Khanh and Hoàng Văn Tâm, Vietnam 2050 Calculator
- Zulfia Khazhina, Intern, Climate Action and Inclusive Development Unit, GGGI

Moderator

 Siddhartha Nauduri, Senior Analyst for Green House Gas Data Measurement and Verification for Transparent MRV, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.

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¹⁶³ Khazhina, Zulfiya, GGGI.

23 Increasing Access to Climate Finance in the Pacific

Agenda

9:00-9:05 (5 minutes)	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
9:05-9:15 (10 minutes)	Presentation: Introducing the Climate Finance Access Network: Increasing Access to Climate Finance in the Pacific Presenter: Ms. Laetitia De Marez, Director, Climate Finance Access Network
9:15-10:15 (60 minutes)	 High-Level Panel I: Title (including Q&A) Chair: Mr. Lasse Ringius, Head of Green Investment Services, GGGI Panelists: Ms. Laetitia De Marez, Director, CFAN Ms. Charlotte Camille Turk, Senior Regional Investment Officer, GGGI Mr. Maroun Fayssal, Global Affairs Canada Mr. Jeffery Lamb, Climate Finance Director, Ministry of Finance, Kiribati (TBC) Ms. Frances Brown Reupena, CEO, Ministry of Natural Resources and Environment, Samoa Mr. Yusuke Taishi, UNDP
10:15-10:20 (5 minutes)	Closing remarks Global Affairs Canada

Session overview

The issue of mobilizing and allocating the \$100bn in climate finance for the Global South has been diagnosed to death. The problem is well understood: developed countries have not been ambitious enough in their pledges of support, and the system of accessing existing finance is obstructively complex.

This is particularly true for Small Island Developing States (SIDS), which face systemic challenges with accessing adaptation financing, especially from multilateral sources. While Pacific countries often know what they need to do to improve their resilience, increase adaptation efforts, and meet NDC commitments, without clear, access-oriented solutions in place, neither COP26 nor the action that follows can be a success.

The Climate Finance Access Network (CFAN) is a direct response to this need. Coordinated by RMI and funded with an initial contribution of CAD \$9.5 million from the Government of Canada, CFAN is a global network designed to provide a prompt and practical solution to the climate finance bottleneck in

SIDS, Least Developed Countries and African countries. A demand assessment conducted by CFAN in 2019 interviewed 100 representatives of 45 developing countries from both public and private sectors, and revealed resounding demand from countries, with 98% stating they would be interested in receiving a climate finance advisor.

In August 2021, CFAN partnered with GGGI to announce the first eight countries to receive dedicated advisors for climate finance. Fiji, Kiribati, Papua New Guinea, Samoa, the Solomon Islands, Tonga, Tuvalu and Vanuatu will receive advisors specifically trained and placed to unlock critical climate finance in developing countries.

This session aims to highlight ready to scale initiatives in for SIDS focused on access and implementation, such as the Climate Finance Access Network. It will:

- Discuss the need for the Global North to support the Global South and how CFAN can act as a catalyst
- Discuss priorities for climate adaptation and mitigation efforts in SIDs and barriers to financing
- Discuss how challenging securing funding can be overcome and how CFAN's innovative approach will help.
- Discuss the opportunities for and benefits of scaling CFAN to reach SIDS and LDCs in the Caribbean and African regions.

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.

24 Implementing NDCs in the Pacific

♣ Agenda

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15:00-15:05 (5 minutes)	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
15:05-15:10 (5 minutes)	Overview of the Regional Pacific NDC Hub Mr. Christian Görg Project Manager, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Regional Pacific NDC Hub
15:10-15:15 (5 minutes)	NDC Implementation Progress and Achievements GIZ Mr. Ravinesh Nand Senior Technical Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
15:15-15:20 (5 minutes)	NDC Implementation Progress and Achievements SPREP Ms. Vanda Faasoa-Chan Ting Technical Advisor, Secretariat of the Pacific Regional Environment Programme (SPREP)
15:20-15:25 (5 minutes)	NDC Implementation Progress and Achievements SPC Mr. Amit Singh Climate Change Project Development Specialist, The Pacific Community (SPC)
15:25-15:30 (5 minutes)	NDC Implementation Progress and Achievements GGGI Mr. Daniel Muñoz-Smith Country Representative for Fiji, Kiribati, Tonga, and Vanuatu, Global Green Growth Institute (GGGI)
15:30-15:40 (10 minutes)	NDC Hub Progress Story Ms. Rebecca Eldon Advisor, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
15:40-15:45 (5 minutes)	NDC Hub Strategy 2030 Mr. Tutii Chilton Chairperson, Regional Pacific NDC Hub Steering Committee, and Executive Director, Palau Energy Administration
15:45-15:55 (10 minutes)	Question and Answer Session Dr. Noim Uddin Senior Officer MRV and NDC Enhancement, Global Green Growth Institute (GGGI)

15:55-16:00

Closing

(5 minutes)

Mr. Christian Görg

Project Manager, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ),

and Regional Pacific NDC Hub

Session overview

The Regional Pacific NDC Hub (NDC Hub) supports 14 Pacific Islands Countries (PICs) to enhance and implement their Nationally Determined Contributions (NDCs) under the Paris Agreement. For more information on the NDC Hub, please visit: https://pacificndc.org

At the GGGWeek2021, the NDC Hub will be presenting a session on Implementing NDCs in the Pacific. The presentation will discuss the Hub's progress through the range of projects currently under implementation by the Hub's partners, highlighting its key achievements and lessons learnt, and present its Long-term Strategy 2030.

The NDC Hub is administered by GIZ and implemented in partnership with the Global Green Growth Institute (GGGI), the Pacific Community – SPC, and the Secretariat of the Pacific Regional Environment Programme (SPREP), with financial support of the Germany, Australia, and New Zealand Governments.



Implementing Partners







Donors





Aid Programme





For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.

25 Blue Economy & Coastal Resilience Building: Climate Smart Solutions for Sustainable Livelihood in Asia/Pacific

♣ Agenda

14:00-14:05 (5 minutes)	Welcoming remarks H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
14:05-14:35 (30 minutes)	Keynote Speeches Indonesia's ambition for large-scale mangrove restoration and blue economy development Dr. Ir. Arifin Rudiyanto, MSc., Deputy Minister, Bappenas, Indonesia
	Blue Economy needs and ambitions in Fiji /the Pacific Mr. Vineil Narayan, Acting Head of the Climate Change and International Cooperation Division, Ministry of Economy, Fiji
14:35-15:35	Presentations
(60 minutes)	Presentation I Climate vulnerability of coastal areas in Asia Speaker: Dr Aljosja Hooijer Deltares
	Presentation II Accelerating adaptation by integrating nature based solutions into water infrastructure in Asia (Building with Nature Asia) Speaker: Mr. Pieter van Eijk Wetlands International Presentation III
	The Promotion of Clean Water production among the remotely island within Indonesia archipelago by the utilization of Marine based Energy sources Speaker: Mr. Djoko Budi Waluyo PT Nusatama Berkah
	Presentation IV Sustainability on Coastal Climate and Livelihood Speaker: Dr. Nilam Sari Sekolah Tinggi Teknologi Industri (STTI) Bontang

Presentation V

Investment Analysis for Mangrove Ecosystems in the Ayeyarwady Region, Myanmar

Speaker: Dr. Aaron Russell, GGGI and Nina Doetinchem, World Bank In collaboration with World Bank and University of Queensland

Presentation VI

Green Nipa Palm Sugar Production in the Ayeyarwady Region, Myanmar

Speaker: Mr. Clement Jaloux Unilever Ltd

In collaboration with Zawgyi Premier Co., Ltd; GGGI

15:35-16:00 (25 minutes)

Panel Discussion and closing

Summary

The Blue Economy involves a variety of economic sectors that are central to the prosperity of countries with ocean coastlines, including fisheries and aquaculture, tourism, marine construction, and transportation. Coastal restoration techniques are strengthening coastal resilience through inclusive, nature-based solutions. An integrated, multi-sectoral Blue Economy strategy will contribute to higher revenues from marine and coastal activities, and will be key for equal opportunities and livelihoods, healthier oceans, and coastal ecosystems that can sustainably generate services and products while protecting biodiversity.

Coastal and marine ecosystems play a role in the creation of green jobs, and achievement of SDGs 13 and 14, and serve as a carbon capture and storage system. However, achieving potential benefits requires improved spatial planning in marine and coastal areas, establishment of marine protected areas, and reduction of pollution. Also key are stronger multistakeholder partnerships and international sharing of good practice.

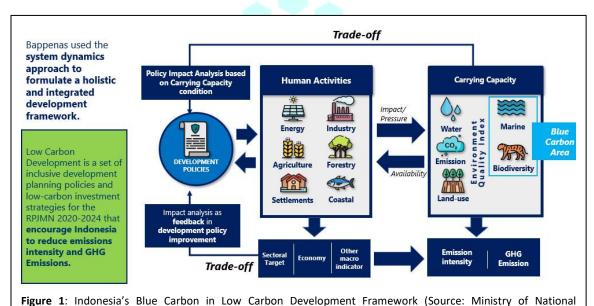
Many coastal areas of Asia are highly vulnerable to climate change, including some 1,800 kilometers of Indonesia's coastline. Rising sea levels and sinking terrain cause an increased risk of floods and coastal land loss. Southeast Asia has the largest low-lying coastal area and the most severe and widespread land surface subsidence in the world. Satellite LIDAR¹⁶⁴ data allow for high-accuracy global elevation models that can identify what land is threatened by flooding. Mapping of elevation and sea-level rise risk can yield better decisions on where to build hard defenses, apply nature-based solutions for coastal protection, and reduce investments that may be lost in the future.¹⁶⁵

Priority programs of Indonesia's Medium-Term National Development Plan 2020-2024 aim to recover coastal and marine environmental damage, and protect and rehabilitate coastal and marine ecosystems. The government supports activities at the national and regional level to build and develop a sustainable marine and fisheries sector under Blue Economy principles (Figure 1). It intends to marshal financing through sustainable blue funding initiatives which combine blended finance, blue bonds, and a blue

¹⁶⁵ Hooijer, Aljiosja, Deltares, the Netherlands.

¹⁶⁴ LIDAR is light detection and ranging.

sovereign wealth fund. Indonesia has about 20% of the world's mangroves and has policies in place to rehabilitate 50,000 hectares and manage these precious assets. Some key barriers limiting impact investments in sustainable blue funding include the deficiency in the marine resources data and management, the lack of business readiness, absence of environmental and social investment criteria, lack of coordination between stakeholders, limited public infrastructure and market access, and weak delivery mechanisms.



A new approach to water and coastal engineering involves building with nature rather than building in nature. Wetlands International (WI) has actively pursued this approach in a participatory way with local communities in different Asian countries. As shown in a project in Kota Semarang, Indonesia, sea dikes can be used for flood protection of inland villages and aquaculture. Ecosystem engineers can minimize environmental impacts of the sea dike by introducing tidal dynamics and removing sediment to support mangrove development. Inland buffers can be a site for water storage and local fisheries. WI aims to leverage investment for large scale adoption of build-with-nature across 15 landscapes, benefitting 30 million people.¹⁶⁷

The community of Papagarang, in Indonesia's Komodo National Park, previously had to buy clean water off island until an NGO, Komodo Water, began operating a Sea Water Reverse Osmosis (SWRO) unit equipped with a hybrid solar-diesel generator set. The village has a source of ground water, but it is brackish and requires filtering to make it drinkable. An electric submersible water pump powered by a marine-based energy source could draw ground water and store it in a reservoir until the water is treated by a nature filtering system, solar radiation distillation, membrane method (reverse osmosis), or electro dialysis method.¹⁶⁸

Lembongan island, an Indonesian tourist destination located southeast of Bali, lacks spring water and has been dependent on a diesel-powered SWRO unit to produce drinking water. But wave energy, sea breeze

Development Planning/Bappenas, Government of Indonesia)

¹⁶⁶ Hidayat, Yahya Rachmana, Ministry of Planning, Indonesia.

¹⁶⁷ van Eijk, Pieter, Wetlands International, the Netherlands.

¹⁶⁸ Waluyo, Djoko Budi, PT Nusatama Berkah, Indonesia.

wind, and tidal energy sources could be converted to electric power for clean water production to supply the community and support the needs of households, public services and the tourism sector's consumption (Figure 2).¹⁶⁹



Figure 2: Marine-based Energy conversation and clean water production system (Source: PT Nusatama Berkah, Djoko Budi Waluyo)

A project in Bontang, Indonesia provides a successful case study in model value chain conservation of mangroves. Local people are responsible for the mangrove conservation, with support extended by public, private and non-profit organizations. The government provides an enabling environment through appropriate planning and policy development. Mangrove farmers manage nurseries and seedlings can be sold or planted. There are possibilities for ecotourism.¹⁷⁰

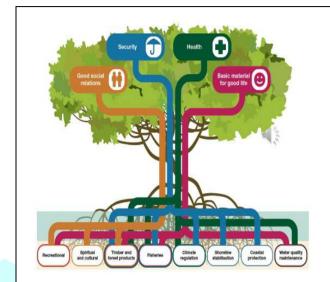
GGGI, Queensland University, and the World Bank piloted a 3Returns framework¹⁷¹ to assist decision makers in assessing the value of sustainable landscape investments in the context of mangrove forest reserves in Myanmar's Ayeyarwady region (Figure 3). The partners also conducted an initial assessment of several value chain opportunities in the area. The pilot considered three services - carbon sequestration, coastal protection and river banks protection - and three types of mangrove products (fuelwood, fishery, and nipa palm). Subsequently, the 3Returns framework was merged with the World Bank's wealth accounting and evaluation of ecosystems services framework, and further analysis conducted across the entire Ayeyarwady region.¹⁷² Overall, the analysis reveals that the investments proposed through the different green scenarios improve the monetary and non-monetary benefits, as well as capital output indicators, when compared to the BAU.

¹⁶⁹ Ibid

¹⁷⁰ Sari, Nilan, Sekolah Tinggi Teknologi Industri Bontang, Indonesia.

¹⁷¹ See: https://gggi.org/report/the-3returns-framework-a-method-for-decision-making-towards-sustainable-landscapes/.

¹⁷² Russell, Aaron, GGGI and Nina Doetinchem, World Bank.



ECOSYSTEM SERVICES:

Regulating Services:

- Carbon sequestration
- Coastal protection and river bank protection

Provisioning Services:

- · Selected mangrove product
 - · Fuelwood
 - Fishery
 - Nipa palm

Figure 3: 3Returns Methodology and approach used in Myanmar system (Source: World Bank, GGGI, The University of Queensland)

Also in Myanmar, using the 3Returns approach, Unilever partnered with its local supplier of palm sugar, Zawgyi, and GGGI, to determine the potential for developing a net-zero carbon emissions nipa palm sugar production and processing value chain. A pre-feasibility study was conducted to assess the profitability, efficiency, and landscape impact of difference processing alternatives, taking into account the resources available in the region, while integrating a business and landscape sustainability perspective. Three different nipa palm sugar production models were analyzed based on the nipa palm sap processing technologies and resources available in the region.¹⁷³

Asian and Pacific countries are highly vulnerable to sea level rise, coastal erosion and subsidence. As highlighted in this session through examples from Indonesia and Myanmar, inclusive, nature-based responses can be implemented to enhance ecosystem resilience and promote livelihoods and jobs. The 3Returns framework aids decision makers in the formulation and analysis of policies, financial instruments, allocation of resources, and identification of practices for sustainable landscape interventions.

¹⁷³ Jaloux, Clement, Unilever.

ACKNOWLEDGEMENT

Speakers

- Yahya Rachmana Hidayat, Director of Energy, Mineral, and Mining Resources, Ministry of National Development Planning, Indonesia
- Aljosja Hooijer, Senior Advisor, Deltares, the Netherlands, and Research Professor, National University of Singapore
- Pieter van Eijk, Programme Head, Deltas and Coasts, Wetlands International
- Djoko Budi Waluyo, Business Development Division, PT Nusatama Berkah (Indonesia)
- Pieter van Eijk, Programme Head, Deltas and Coasts, Wetlands International
- Nilan Sari, Researcher, Sekolah Tinggi Teknologi Industri Bontang (Indonesia)
- Aaron Russell, Country Representative, GGGI Uzbekistan & Nina Doetinchem, Senior Environment Specialist, World Bank
- Clement Jaloux, Sustainable Sourcing Manager, Unilever

Moderator

• Marcel Silvius, Country Representative, GGGI Indonesia

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-climate-smart-agriculture-sustainable-landscape/.

26 Green Hydrogen Economy in GGGI member countries

Agenda

14:00-14:10 Inaugural Session

(10 minutes) Welcoming Remarks

H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)

Dr. Frank Rijsberman, Director-General, Global Green Growth Institute (GGGI)

Special Address

H.E. Alfredo Carlos Bascou, Argentina Ambassador to South Korea

14:10-15:40 Stakeholder perspective on Green Hydrogen Development

(90 minutes)

14:10-14:25 **Presentation 1:**

(15 minutes) GGGI's Green Hydrogen Initiatives

Mr Nishant Bhardwaj - GGGl

14:25-14:40 **Presentation 2:**

(15 minutes) Green Hydrogen Economy - Policy Perspective

Morocco Mr. M. Mohamed Ouhmed - Country's targets to develop green growth economy and achieve net zero through renewable energy and other clean alternatives and the suitability of green hydrogen in achieving these targets shall be discussed. The presentation shall also cover the current and future policy initiative to promote green hydrogen including financial incentives.

14:40-14:55 **Presentation 3:**

(15 minutes) Technology Development in Green Hydrogen

Mr YoungTak Kim - Siemens - The presentation shall highlight the current technology perspective, benefits and scale of deployment, and future and current cost of green hydrogen. Also, key elements should be discussed which may help in bringing down the cost including R&D, new technologies etc.

14:55-15:10 **Presentation 4:**

(15 minutes) Hydrogen fuel cells helping to achieve net zero

Mr Harry Oh - Bloom Energy Korea

15:10-15:25

Presentation 5:

(15 minutes)

Outlook on Demand for Green Hydrogen - End User Perspective

Mr Kwangmin An (Andy) - KOGAS - The presentation shall discuss the need for green hydrogen across various sectors including transport, industries, and domestic. Key consideration in developing long term demand for green hydrogen shall also be

highlighted.

15:25-15:35

Q&A on Presentation

(10 minutes) 15:35-15.55 Moderator - Nishant Bhardwaj Panel Discussion: Towards green hydrogen economy

(20 minutes)

Moderator - Dr. KyungNam Shin, ADG GGGI

IOCL (Indian Oil Corporation, India) (Mr Subodh Kumar)

Morocco (Mr. M. Samir Rachidi - IRESEN)

World Bank (Ms. Surbhi Goyal)

Hyundai Motors (Mr. K. H. Cho)

15:55-16:00 (05 minutes) Closing Remarks and Vote of Thanks

Dr. KyungNam Shin, Assistant Director General Investment and Policy Solution Division, Global Green Growth Institute (GGGI)

Summary

As more countries announce pledges to achieve net-zero emissions, attention is moving beyond greening and decarbonizing the power sector towards tackling hard-to-abate emissions sources and sectors like iron and steel production, aviation, shipping, chemicals and petrochemicals manufacturing, and heavy transport. Green hydrogen is a leading option for reducing hard-to-abate emissions.

Green hydrogen is produced using renewable energy and electrolysis to split water and is distinct from grey hydrogen, which is produced from methane and releases greenhouse gases into the atmosphere, and blue hydrogen, which captures those emissions and stores them underground to prevent them causing climate change. Virtually all of the hydrogen produced today is produced with coal or gas. Gray hydrogen costs US\$1-2/kilo, blue hydrogen \$2-3/kilo, and green hydrogen \$2.50-7/kilo. A European alliance targets producing green hydrogen at \$1.82/kilo by 2030 including transmission and storage cost. 174

GGGI;s Green Hydrogen Program is a multi-country initiative that works to develop a green hydrogen ecosystem through project development and deployment. It leverages international collaboration with public and private sector stakeholders to create bankable business models. It aims to generate \$500 million in investment in three countries - India, Indonesia and Morocco - over a three-year period. Key challenges include a lack of adequate policy frameworks and institutional capacity, high technology and Opex costs, limited availability of electrolyser production capacity, demanding storage and logistics requirements, price and offtake risk, and changing project finance conditions given multiple uncertainties. 175

143

¹⁷⁴Bhardwaj, Nishant, GGGI.

¹⁷⁵ Ibid.

Among the measures that Morocco has adopted to accelerate its energy transition include a goal to have renewables account for 52% of its electricity mix by 2030, placing renewable energy production units at all desalination plans; supplying clean energy in industrial zones; and preparing roadmaps for green hydrogen, the exploitation of marine energy, energy recovery from biomass, and research, development and innovation (Figure 1). Morocco could become a key actor in the development of green hydrogen because of its logistics infrastructure, industrial fabric, capacity to develop technologies, geographic setting, energy links, renewable energy potential, and several target sectors (industry, green ammonia, mobility, energy storage). The country has created a cluster with the private sector to pave the way for public-private partnerships in green hydrogen, and has formed an R&D and innovation platform to support the ecosystem. The country has created a cluster with the private sector to pave the way for public-private partnerships in green hydrogen, and has formed an R&D and innovation platform to support the ecosystem.



About 6 million tonnes of grey hydrogen is currently being produced in India. There are plans to replace at least 20% of grey hydrogen with green hydrogen in factories and plants. The Indian Oil Corporation has purchased 15 buses operating on hydrogen fuel cells for use on Delhi's roads. The World Bank has begun upstream work to explore the potential for green hydrogen in five sectors in India. Subsequent support could include absorbing first mover risk, mobilizing concessionary financing, and reaching out to the private sector to explore how its concerns about investing can be addressed. 179

Siemens Energy aims to build 1,000 MW modular design electrolyzer plants by 2028. If the price of green hydrogen comes down to US\$2.30 by 2030, it could be used commercially in trains, SUVs, trucks, and mid-size vehicles. A European flagship project for the generation and use of green hydrogen (H2 Future) involved the installation of a 12-module array Silyzer 300. The project sought to highlight potential for breakthrough steelmaking technologies that replace carbon by green hydrogen as a basis for upscaling to industrial dimensions. The Haru Oni Pilot Project in Chile is the first integrated plan for climate-neutral efuel production from wind and water. Siemens sees the standardization, modularization and

¹⁷⁶ Ouhmed, Mohamed, Government of Morocco.

¹⁷⁷ Rachidi, Samiri, IRESEN, Morocco.

¹⁷⁸ Kumar, Subodh, Indian Oil Corporation.

¹⁷⁹ Goyal, Surbhi, World Bank.

¹⁸⁰ Kim, Young Tak, Siemens Energy Korea.

manufacturing as the key factors to drive the scale to Gigawatts in green hydrogen. Figure 2a and 2b present some scenario analysis and attractive use cases for green hydrogen by 2030.

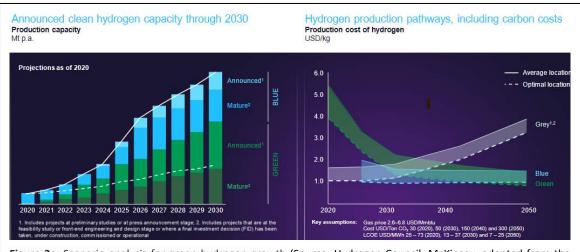


Figure 2a: Scenario analysis for green hydrogen growth (Source: Hydrogen Council; McKinsey, adopted from the presentation slides)

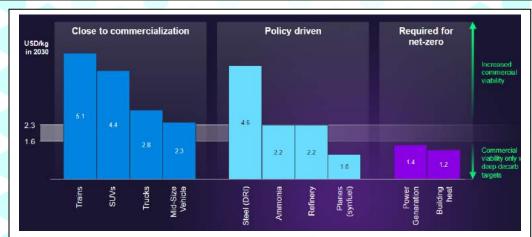
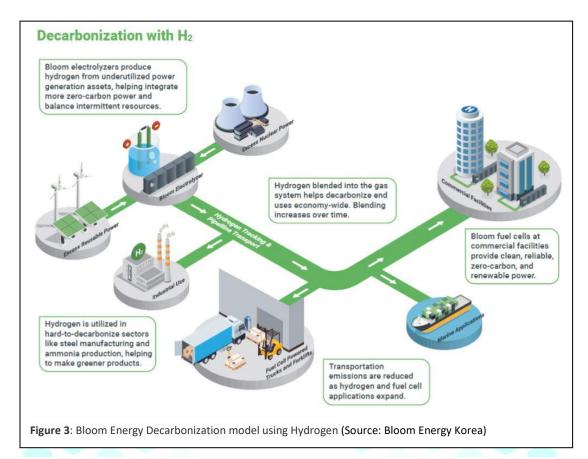


Figure 2b: Attractive use cases for green hydrogen by 2030 (Source: Hydrogen Council, adopted from the presentation slides)

California-based Bloom Energy is developing an electrolyzer that it seeks to pilot for the first time in South Korea in early 2022 to show commercial viability. Figure 3 presents Bloom Energy Green Hydrogen Decarbonization model.



South Korea seeks to become a world leader in hydrogen, producing 5.26 million tons/year by 2040, compared to 220,000 tons/year in 2021. The Korea Gas Corporation (KOGAS) established in 1983, is driving the national vision of a Hydrogen-leading country. Whereas all of the hydrogen currently produced is grey, the vision is that all hydrogen production in South Korea will be green/blue by 2040. Figures 4a and 4b present the National green hydrogen vision 2030 and the plans to make Korea a Hydrogen-leading country.

Slowing the growth of green hydrogen is the need for more mature technologies, and the cost of large scale deployment. Government support will be needed to trigger the market. Supportive financing mechanisms will be required to make green hydrogen competitive, like carbon taxes, feed-in tariffs, and premium prices. The World Bank has published a paper on green hydrogen in developing countries. 183

¹⁸¹ Chung, Jaeyong, KOGAS, South Korea.

¹⁸² Rachidi, Samir, IRESEN, Morocco.

¹⁸³ World Bank (2020). Green Hydrogen in Developing Countries.

ACKNOWLEDGMENT

Speakers

- Frank Rijsberman, Director General, GGGI
- Alfredo Carlos Bascou, Ambassador of Argentina to the Republic of Korea
- Nishant Bhardwaj, Country Representative, GGGI India
- Mohamed Ouhmed, Director of Renewable Energy and Energy Efficiency, Government of Morocco
- Young Tak Kim, Director, Strategy & Business Development/New Energy Business, Siemens Energy Korea
- Oh, Harry, Representative, Bloom Energy Korea
- Jaeyong Chung Manager/Green Hydrogen Development Team, KOGAS
- Subodh Kumar, Advisor, Indian Oil Corporation
- Samir Rachidi, Research Institute for Solar Energy and New Energies (IRESEN), Morocco
- Surbhi Goyal, Senior Energy Specialist, World Bank
- Kyung-Nam Shin, Assistant Director General and Head, IPSD, GGGI
- Henry Kyounghyun Jo, Hyundai, South Korea

Moderator

• Samrat Ray, Senior Program Officer, GGGI India

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-renewable-energy-energy-efficiency/.

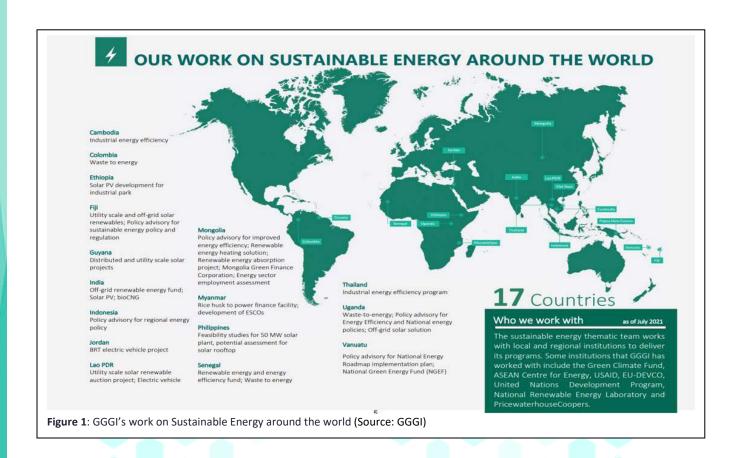
27 Scaling-up Renewable Energy Solutions for Ambitious Net-Zero 2050 Targets

Agenda

15:00-15:05 (5 minutes)	Welcome remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
15:05-15:30 (25 minutes)	Part I: GGGI's work on renewable energy to achieve net-zero 2050 targets in Asia
(23 minutes)	Moderator: Muharrem Askin, Energy Specialist, GGGI
	Presenters: Mr. Jaeseung Lee, Mekong Sub-regional & Vietnam Country Representative, GGGI Mr. Jambaa Lkhagva, Director of Energy Market Research and International Cooperation Division, Mongolia ERC Ms. Annaka Marie Peterson, Mongolia Country Representative, GGGI
	First Round Q&A
15:30-15:55 (25 minutes)	Part II: Private sector contribution to scale-up renewable energy and lessons learned
	Moderator: Mr. Hyun S. Lee, Senior Regulatory Affairs Manager, RWE Renewables
	Presenters: Mr. Jens Bøgsted Orfelt, Regional President - Offshore Development APAC, RWE Renewables Mr. Markus Kösters - Head of Business Development - New Markets, RWE Renewables
	Mr. Matthew Dickie - Senior Regulatory Affairs Manager, APAC Lead, RWE Renewables
	Second Round Q&A
15:55-16:00 (5 minutes)	Key takeaways & closing remarks Muharrem Askin, Energy Specialist, GGGI

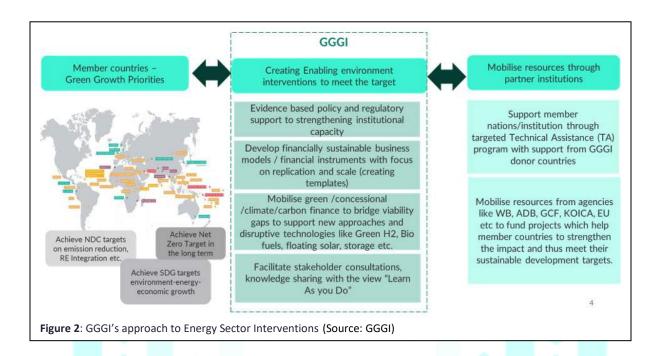
Summary

Implementation of the Paris Agreement can be accelerated by scaling up generation of renewable energy. The Global Green Growth Institute (GGGI) sustainable energy thematic team is working with local and regional institutions in 30+ countries to enable achievement of Nationally Determined Contributions (NDC), Sustainable Development Goals (SDG) and Net Zero targets (Figure 1).



GGGI's team helps countries create enabling environments to meet these targets and mobilizes resources through partner institutions. Examples of GGGI assistance include developing green bonds in Vietnam, constructing a floating solar project in India, assisting Lao PDR in preparing ambitious NDC targets to achieve Net Zero by 2050 and enhancing NDC implementation capacities, and scoping opportunities to develop green hydrogen in countries such as Indonesia and Morocco. ¹⁸⁴ Figure 2 presents GGGI's approach to energy sector interventions combining policy support with the development of financially sustainable business models, the mobilization of green finance and the capacity building.

¹⁸⁴ Jason Lee, Mekong Subregional & Viet Nam Country Representative, GGGI



Coal accounts for about 90% of Mongolia's energy generation and is expected to remain a major contributor to the country's GHG emissions in 2050. The government set a target to reduce GHG emissions by 22.7% by 2030. GGGI has worked with the government to develop a 2050 emissions scenario (Figure 3). In addition to coal, the agricultural sector is expected to be a leading contributor to GHG emissions through 2050. In recent years, the government has adopted measures that promote renewable energy, including: (a) Auction withtariff ceilings for grid connected wind and solar, competitive procurement; and (b) Distributed generation tariffs for distributed generation along with monthly net energy metering. ¹⁸⁵

¹⁸⁵ Jambaa Lhagva, Market Research and International Cooperation Division, Mongolia, and Annaka Peterson, GGGI Mongolia

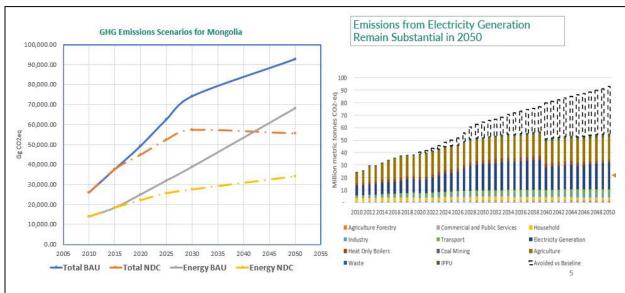


Figure 3: Energy Transition and Prospects for Net-Zero in Mongolia (Source: GGGI Mongolia, Energy Regulatory Commission - Mongolia)

Many areas of Asia and the Pacific have excellent wind resources. The announcement of Net Zero goals by governments make the region ripe for exponential growth of renewable energy. Clear regulatory frameworks that embrace novel technologies (like floating and green hydrogen), and a solid pipeline that will justify significant supply chain investments, are needed to realize Net Zero ambitions. Key regulatory fundamentals include government targets for reduction of GHG emissions and reaching Net Zero, revenue stability, supporting infrastructure, robust permitting processes, and local content.¹⁸⁶

Japan has strong foundations for growth of offshore wind power development, including notable targets for emissions reduction, Net Zero, and renewables, as well as a feed-in tariff set through competitive auctions for offshore wind. Innovative floating offshore wind platforms can further accelerate the growth of renewables globally including in Asia. However, qualitative criteria for auctions could be clearer, base port capacity needs to be scaled up, market access barriers for foreign developers could be removed, and market-based support mechanisms for hydrogen are needed to realize potential growth. Figure 4 presents RWE's approach for upscaling renewable energy in Asia-Pacific.

¹⁸⁶ Orfelt, Jens Bogsted, RWE.

¹⁸⁷ Dickie, Matthew, RWE.



Excellent wind resource provides options for home grown renewables

Many areas in APAC have excellent wind resource and we want to aid governments in the region in the transition from imported fossils fuels to home grown renewables



Net zero goals fosters not only sustainable energy but also sustainable job generation

The announced NetZero goals by APAC governments makes us comfortable in APAC being a market which is ripe for exponential growth, which is why we routinely participate in efforts to safely develop, build and operate cost-competitive offshore wind farms creating thousands and thousands of local jobs



Enabling regulatory frame works and pipelines are crucial

What we as developers and local supply need to realise these net zero ambitions are clear regulatory frameworks which embrace deployment of novel technologies such as floating and green hydrogen and a solid pipeline that will justify the significant supply chain investments which are required to reach these goals



World class development programme

We are (with select local partnerships) well placed to execute these ambitious plans. We mixed teams of both local an international expertise with extensive knowledge in how to perform world class development programmes. Given our extensive supply chain engagement and least not our experience as one of the worlds leading developers in offshore wind

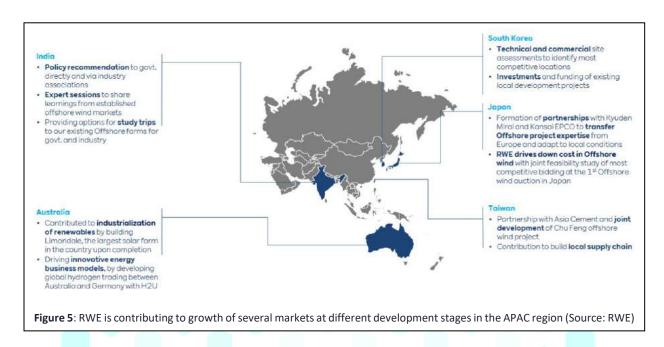
RWE

Figure 4: Potential to upscale renewable energy in Asia-Pacific - RWE's approach (Source: RWE)

Australian states have incentivized recent growth in renewables, but the federal green certificate scheme has plateaued, a market-based support mechanism for hydrogen is needed to realize potential growth, and the grid built for a thermal fleet is straining to accommodate renewables. India has set ambitious targets, but the country lacks both a permitting process for offshore wind development, and a market-based support mechanism for hydrogen. Taiwan has well-developed renewable support mechanisms but needs a transparent process for determining no-build zones, clearer qualitative criteria for auctions, and, as in other jurisdictions, a market-based mechanism for hydrogen (Figure 5).¹⁸⁸



¹⁸⁸ Ibid.



Knowledge sharing and partnership development among green growth leaders and practitioners, improvements to the policy and regulatory environment for renewable energy, and involvement of experienced energy development firms in undertaking renewable energy projects will contribute to global efforts to build back better.

ACKNOWLEDGMENT

Speakers

- Jason Lee, Mekong Subregional & Viet Nam Country Representative, GGGI
- Jambaa Lhagva, Director, Energy Market Research and International Cooperation Division, Mongolia
- Annaka Peterson, Country Representative, GGGI Mongolia
- Jens Bogsted Orfelt, Regional President, Offshore Development, RWE
- Matthew Dickie, Senior Regulatory Affairs Manager, APAC Lead, RWE
- Markus Kösters, Head of Business Development, New Markets

Moderators

- Muharrem Kemal Askin, Specialist, Energy, GGGI
- Hyun S. Lee, RWE

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-renewable-energy-energy-efficiency/.

28 The Road to COP26: what does success look like for developed and developing countries?

♣ Agenda	
16:00-16:05	Welcome Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
16:05-16:10	 Welcome Remarks Mahamadou Tonkara, Director, Office of the Director-General, GGGI
16:10-16:20	Introductory Speech Simon Smith, British Ambassador to the Republic of Korea
	Keynote speeches
16:20-16:25	 Raising global climate ambition at COP26 (Video Message) Tong-Q Lee, Director-General, Ministry of Foreign Affairs, Republic of Korea
16:25-16:35	Climate Ambition and Emerging Economies
	Gloria Cid Carreño, Chilean Ambassador to the Republic of Korea
16:35-16:45	 The need for ambitious climate action, the LDC and SIDS Perspectives Achala Abeysinghe, Asia Regional Director & Head of Programs, GGGI
16:45-17:30	 Discussion Panel - Net Zero Chair: Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development, GGGI Achala Abeysinghe, Asia Regional Director & Head of Programs, GGGI Tom Moody, Regional Director SEA, Climate & Energy, UK Foreign, Commonwealth & Development Office (FCDO) Tenzin Wangmo, Climate Diplomacy Advisor, Office of the Chair of the LDC Group under UN Climate Change Gloria Cid Carreño, Chilean Ambassador to the Republic of Korea
17:30	Closing Remarks • Dr. Frank Rijsberman, Director-General, GGGI

Session overview

COP26 is of particular significance as it will mark 5 years since the adoption of the Paris agreement at COP21 in 2015. The UK Government declared 2020 a "year of climate action". Since then, the world is going through a disruptive pandemic, which has caused a backlog of negotiation issues. This has further increased the expectations about what the COP26 in Glasgow will deliver.

From November 1 – 12, 2021, over 190 world leaders will gather in Glasgow where they will join forces with government representatives, businesses, NGOs, and citizens for a two-week long climate change conference.

Co-organized by the Global Green Growth Institute (GGGI) and the British Embassy in Seoul, the upcoming virtual event will serve as an opportunity for experts and decision makers from developing and developed nations to address their expectations for COP26 and to understand how international organizations like GGGI has provided a range of services for its Members and partners, which have directly and indirectly supported the NDC revision process.

Of the total of 75 Parties to the Paris Agreement that met the 2020 deadline for revised NDC submission, 20 were among GGGI's 39 Members. Additionally, five GGGI partners submitted their revised NDCs in 2020, and more have committed to submit in 2021. There are positive trends in that climate change has like never before entered the agenda in many developed countries. Nevertheless, the UNFCCC Synthesis reports show that with the combined levels of ambition, the world is on catastrophic path to a 2.7 degree warming.

The developing world is the least responsible for climate change but most vulnerable to the impacts. Amid concerns of the pandemic, there is a clear call for the COP26 to be inclusive to ensure strong voices of least developed countries (LDCs) in decision making and in benefitting from the shift towards low emission development pathways.

Discussions will revolve around the importance of a) securing global net zero emissions by 2050; b) deploying adaptation measures to protect those who are the most vulnerable to the impacts of climate change; and, c) mobilizing financial resources for developing countries.

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.

29 Greening Buildings and Infrastructure in Asia: Certification, Partnerships and Finance

	Agenda
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16:00-16:10	 Welcome Remarks and Introduction to GGGI H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI) Introduction - Session Chair, Nicholas Taylor, Senior Officer, GGGI, Investment and Policy Solutions Division.
16:10-17:00	Part 1 Infrastructure: This part of the event will feature innovative approaches to certifying and developing sustainable and resilient infrastructure.
16:10-16:25	Mr. Louis Downing, Chief Executive Officer and Global Infrastructure Basel Foundation & Ms. Eva Pitterling, International Sales Manager PT.TÜV NORD Indonesia SuRe the Standard for Sustainable and Resilient Infrastructure
16:25-16:40	Mr. Amit Mukherjee, Divisional Director, Mott McDonald From Idea to Implementation: Partnerships to Overcome Practical Challenges to Sustainable Infrastructure Development in India
16:40-16:50	Q&A
16:50-18:00	Part 2 Green Buildings: This part of the event will look at how green certifications and standards are being applied in the buildings sector in the region.
16:50-17:00	Panelists: Mr. Christopher de la Cruz, CEO, Philippines Green Building Council Green Building Certification in the Philippines
17:00-17:10	Mr. Christophe Assicot, GGGI Deputy Country Representative of Laos PDR Processes and buildings energy efficiency in the industrial sector in Lao PDR
17:10-17:20	Ms. Tsolmon Namkhainyam, GGGI, Officer - Energy Program Mongolia, Transition to Green and Sustainable Buildings in Mongolia: GGGI Business Case Studies
17:20-17:30	Mr. Djoko Budi Waluyo PT Nusatama Brekah: Creating Green Jobs and Engineered Laminate Bamboo based Green building Materials Utilization
17:30-18:00	Q&A and Panel Discussion with participants from the Buildings part (15 minutes) and with both Buildings and Infrastructure Participants (15 minutes)

Summary

IPCC estimated that 30% of global emissions come from urban areas and 7 out to 10 people will be living in cities by 2050. There is a massive \$2.5 trillion annual shortfall in global infrastructure investment, notwithstanding the fact that sustainable, resilient infrastructure provides benefits to financiers. ¹⁸⁹ Asia region accounts for about \$460 billion per year of missing infrastructure market value. Benefits include lower risk management, enhanced reputation, greater resilience, increased resource efficiency, anticipated regulation, improved recruitment and retention of talent, and higher revenues. ¹⁹⁰

In this context, the Global Infrastructure Basel (GIB) developed SuRe¹⁹¹ – a third-party-verified, global voluntary standard for sustainable and resilient infrastructure – by through a multi-stakeholder approach incorporating inputs from developed and emerging nations to drive the integration of sustainability and resilience aspects info infrastructure development (Figure 1). It provides guidance and serves as a common tool for infrastructure project developers, financiers, and public sector institutions.



Examples of urban development projects in India highlight how partnerships are key to overcome practical challenges and deliver sustainable infrastructure. For example, during project planning and design stage, the private sector conducts surveys and testing, performs engineering tasks, and address environmental and social safeguards in project planning and design. NGOs and CBOs engage communities and collect data. Project financing involves various partners, which may include public-private partnerships, corporate CSR programs, and multilateral funding agencies. Other partnerships can also be found in project

¹⁸⁹ Guggenheim Partners, 2020

¹⁹⁰ Downing, Louis, Global Infrastructure Basel Foundation.

¹⁹¹ SuRe = Standard for Sustainable and Resilient Infrastructure. It was developed by the Global Infrastructure Basil Foundation and Natixis. It contributes at the project level to the achievement of the objectives of international frameworks, like the United Nations Framework Convention on Climate Change.

procurement, implementation, and operations and maintenance. Figure 2 present how Visakhapatnam Chennai Industrial Corridor Development Program is delivering socially inclusive outcomes.



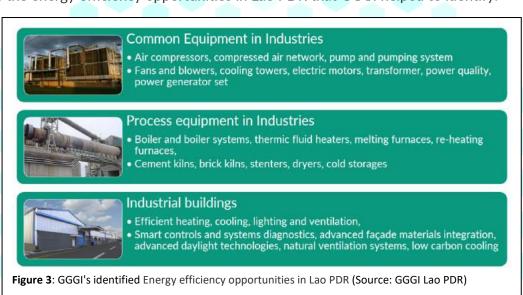
Green building certification supports decarbonization of the built environment; a built environment that delivers healthy, equitable and resilient buildings, communities, and cities; and regeneration of resources and natural systems. The Philippines Green Building Council (PHILGBC), founded in 2007 a member of the World Green Building Council, facilitates the sharing of knowledge on green building in industry to ensure a sustainable environment. PHILGBC uses BERDE (Building for Ecologically Responsive Design Excellence) as a tool to assess, measure, monitor, and certify the performance of green building projects. It features assessment and review of core environmental concerns and additional categories of triple bottom-line concerns. Green building certification supports and complements the due diligence activities of finance institutions, and may be used as a requirement for property developers in the securitization of investment in building projects. 193 To date, PHILGBC has certified under the BERDE program about 100 green building projects in the Philippines, 1000 green building professionals, 100 green building assessors, more than 120 green building fellowships awarded, etc. to advance Net Zero Energy, PHILGBC approach is structured around: (a) Conserve by prioritizing the conservation of energy using passive design strategies to reduce the operational energy demand; (b) Optimize by further reducing the operational energy demand using energy-efficient technologies and strategies; and (c) Renew by using renewable energy for the reduced operational energy demand of the project.

Over the past year, GGGI has been developing a project to support energy efficiency solutions in buildings in the industrial sector in Lao PDR. The approach includes: (a) Institutional arrangement with stakeholder coordination, the establishment and operationalization of a steering committee; (b) Policy formulation,

¹⁹² Mukherjee, Amit, Mott MacDonald.

¹⁹³ De la Cruz, Christopher, Philippine Green Building Council.

including the design of the Green Industry Policy in Lao PDR and the Industrial Energy Efficiency Policy Guidelines and Action Plan; (c) Capacity building through training programs for the development of Energy Services Companies (ESCOs) and on energy auditing; (d) Project origination with energy audits undertaken at 25 selected industrial sites and the development of project financial models and information memorandum; and (e) Investment facilitation through organize investment forum and preparing funding proposal(s) to climate investor(s) including the Green Climate Fund. 194 The energy audits allow to identify energy and costs savings opportunities in selected industrial sectors, assess technology options and design financial models to estimate investments needed, expected payback period and return on investments, extrapolate the findings in selected enterprises to estimate total investment potential at sub-sector level, and develop Information Memorandum to highlight identified opportunities to potential investors. Figure 3 presents the energy efficiency opportunities in Lao PDR that GGGI helped to identify.



The National Green Development Policy of Mongolia aims to reduce building heat loss by 40% by 2030 and mainstream green building concepts across public buildings. Building sector of Mongolia emits around 1/3 of GHG Emissions by consuming 56% of thermal and 38% of power energy (MCUD, 2021). Energy Conservation Law (2015) created enabling environment to accelerate transition to Green and Sustainable Buildings.in that context, GGGI and partners have been preparing a \$700,000, 125-seat green public kindergarten demonstration project in a peri-urban area of Ulaanbaatar where there is no access to central heating, water supply, and sewage systems. Although the initial investment for construction of the school is 26% higher than for an ordinary kindergarten, operation and maintenance costs, including heating, electricity, water and wastewater treatment, is estimated to be 16.6% to 90.0% lower.¹⁹⁵

Among the lessons learned from the demonstration project are that country ownership and stakeholder involvement in the design and scoping phase is important, as is partnership with the government. Monitoring, Reporting and Verification (MRV) frameworks promote green buildings, while awareness raising stimulates interest among public entities about costs and benefits. Measuring and verifying heat

¹⁹⁴ Assicot, Christophe, GGGI.

¹⁹⁵ Namkhainyam, Tsolmon, GGGI.

savings improves chances of securing grants and low-interest loans. Also, the capacity of trusted contractors and public organizations should be built.¹⁹⁶

With regard to materials that can be used for sustainable building construction, bamboo provides a versatile option. The material can also be used for furniture, decoration, rafts and boats, and permeable dam construction for coastal protection. In addition, bamboo shoots provide a healthy food. Aforestation and reforestation programs can ensure bamboo supply.¹⁹⁷

Investors are discovering compelling reasons for making investments in sustainable, resilient infrastructure. Partnerships can overcome obstacles for making such investments, which are critical to address the world's massive infrastructure investment gap, and to advance the green transition. MRV frameworks and standards/certification systems are important for transparency and credibility of green building activities. Improving energy efficiency in buildings can make an important contribution to the reduction of GHG emissions.

ACKNOWLEDGMENT

Speakers

- Louis Downing, Global Infrastructure Basil Foundation
- Eva Pitterling, Project Manager, PT. TÜV Nord Indonesia
- Amit Mukherjee, Divisional Director, Mott MacDonald
- Christopher de la Cruz, CEO, Philippine Green Building Council
- Christophe Assicot, Deputy Country Representative, GGGI Lao PDR
- Tsolmon Namkhainyam, Energy Program Officer, GGGI Mongolia
- Djoko Budi Waluyo, Business Development Division, PT Nusatama Berkah, Indonesia

Moderator

Nicholas Taylor, Senior Officer, Investment and Policy Solutions, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-building-green-cities/.

¹⁹⁶ Ibid.

¹⁹⁷ Waluyo, Djoko Budi, PT Nusatama Berkah, Indonesia.

30 Circular Economy & Waste: Views from donors, countries, and private sector

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100	Agenda
	, ,60,,44

Q&A (10')

♣ Agenda	
17:00-17:05 (5 minutes)	Welcome Remarks H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
	Dr. Kyung Nam Shin, Assistant Director General Investment and Policy Solution Division, Global Green Growth Institute (GGGI)
17:05-17:10 (5 minutes)	Theme Setting - Overview of GGGI's Global initiatives on circular economy & waste management
	Nathalie André , Co-Lead of Waste Community of Practice/ Sanitation Specialist and Global Green Growth Institute (GGGI)
17:10-17:50 (40 minutes)	(Panel discussion) What do donors envision to see more of in circular economy and waste management?
	This session is designed to hear from donor agencies on the policy directions and focused areas in circular economy and waste management.
	Moderator: Shomi Kim, Co-Lead of Waste Community of Practice/Green Cities Specialist, Global Green Growth Institute (GGGI)
	 Panelists André Weidenhaupt, Director General, Ministry of the Environment, Climate and Sustainable Development, Luxembourg. Rieko Kubota, Senior Environmental Engineer, Environment, Natural Resources and Blue Economy (ENB),
17:50-18:35 (45 minutes)	 (Country presentations) Application of circular economy in waste management: experiences from Cambodia, Uganda, Nepal Mr. Vuthy Khorn, Deputy Governor, Kep municipality, Cambodia: Country presentation on Improving institutional arrangements for sustainable waste management in Kep city 7' Philipp T. Straub, Proteen, Uganda; Country presentation on unlocking opportunities with organic waste 7' Luna K. Kansakar GGGI Nepal, Yogendra Chitrakar, Senior Divisional engineer, Ministry of Water Supply, Nepal Country presentation on wastewater and fecal sludge management program 15'

18:35-18:50 (Private sector presentation) Advanced and integrated Maximum Yield Technology (MYT) in Municipal Solid Waste (MSW) management in Southeast Asia by EUWELLE

Marc Loskarn, Project Engineer, EUWELLE Environmental Technology GmbH

18:50-18:55 (5 minutes)

Closing

Shomi Kim, Co-Lead of Waste Community of Practice/Green Cities Specialist, Global Green Growth Institute (GGGI)

Summary

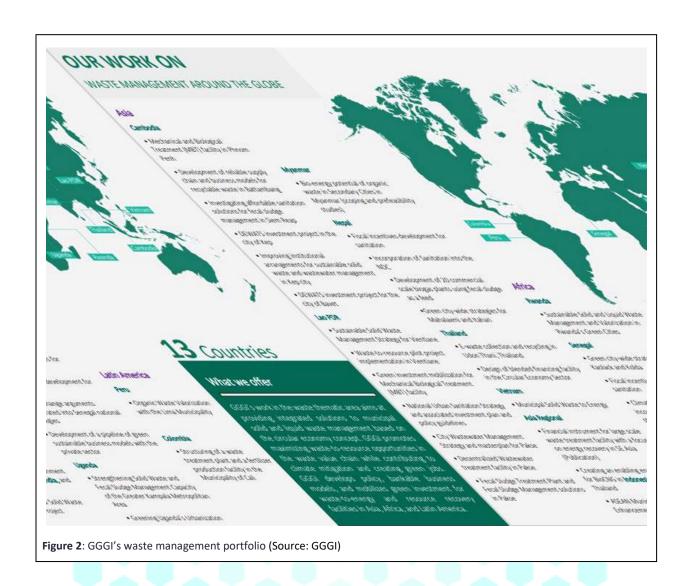
The volume of solid and liquid waste is increasing in many countries due to rapid urbanization and increasing consumption. Yet waste management has been based on a linear approach that does not seek to recover resources during the life cycle of waste. This leads to negative impacts on natural ecosystems and public health. Circular economy solutions that recognize waste as an opportunity to create resources and green jobs are therefore needed.¹⁹⁸

GGGI takes a circular economy-based waste management approach to providing partnership-based, programmatic solutions in municipal waste, electronic and electrical equipment waste (e-waste), industrial waste, and liquid waste. GGGI works to maximize waste-to-resource opportunities in the waste value chain while contributing to climate mitigation and green job creation (Figure 1). GGGI develops policy and bankable business models and mobilizes green investment for waste-to-energy and resource recovery facilities with a growing portfolio across Asia, Africa and Latin America (Figure 2).



¹⁹⁸ Shin, Kyung-Nam, GGGI.

¹⁹⁹ André, Nathalie, GGGI.



Donors' vision for circular economy and waste management

The Government of Luxembourg has approved a €200 million International Climate Finance Strategy 2021-2025 to support adaptation and mitigation measures in developing countries special consideration for LDCs, SIDS and partner and climate dialogue countries)²⁰⁰. The strategy integrates climate actions and pollution reduction measures, focuses on mobilization of private finance, addresses gender aspects, and seeks SDG co-benefits. One of the seven priority themes is resource efficiency and waste management (Figure 3).²⁰¹

²⁰⁰ https://environnement.public.lu/content/dam/environnement/actualites/2021/07/vanuatu/2-Strategie-FCI-2021-07-12-final.pdf

²⁰¹ Weidenhaupt, André, Government of Luxembourg.

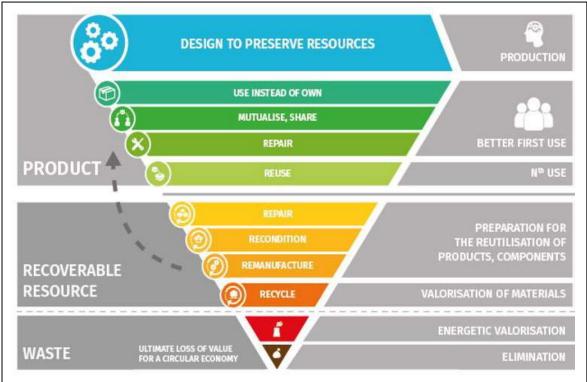


Figure 3: Luxembourg's Circular Economy Strategy Resource Diamond diagram (Source: Ministry for the Environment, Climate and Sustainable Development, Luxembourg)

Under this theme, the strategy supports reduce, reuse, and recycling activities; prevention of plastic and other waste; responsible consumption; waste management that achieves direct GHG reductions; a shift to regenerative, carbon-absorbing production and adoption of healthy and balanced diets with less meat consumption; development of plant-based food products; reduction of food waste and loss; and waste management with adaptative components in the field of flood management and ecosystem protection.²⁰²

Ensuring proper operations and maintenance (OM) in large-scale public sector waste treatment infrastructure is important. Governments do not always have this capacity, so the World Bank works with borrowing countries during project preparation to help them plan OM cost recovery over a period of time (e.g., 15-20 years). The government also has the important role of providing supervision of privately operated waste management facilities.²⁰³

Development agencies that finance waste management facilities use indicators to assess and evaluate performance. Examples include recycling volume, waste collection rates, GHG reduction, and, in the case of capacity building activities, the number of participants being trained. The availability of data influences what criteria can be used. Careful design of planned project outputs can help to ensure that outcomes and targets are achieved.²⁰⁴

²⁰² Ibid.

²⁰³ Kubota, Reika, World Bank.

²⁰⁴ Kang, Chul, KOICA.

Perspectives from Developing Countries

Kep Municipality of 21,000 inhabitants, in southern Cambodia, often received up to 1 million tourists per year (pre-COVID), generating 51 tons of waste per day, up to 100 tons during holidays, with 50% waste collection rate from private contractor. The municipality is constructing a new landfill and material recovery facility. A sanitation and waste authority, and revenue collection system, are being established. In addition, regulations are being developed to improve waste management, and waste recycling opportunities are being created. Surveys of potential users have been conducted to ascertain willingness to pay for waste management services. Profit and loss calculations show that financial sustainability can be achieved based on willingness to pay if waste collection is expanded to the whole city. Legal documents and guidelines are being drafted to establish the waste and sanitation authority. Awareness-raising efforts are taking place among the local population and tourists ahead of the implementation of new regulations. With the right approach, Kep Municipality is planning to learn from good practices and to independently manage solid waste and wastewater infrastructure and operations in a transparent and financially sustainable manner.

In Nepal, GGGI is implementing the Green Sanitation Services Program (GSSP) in collaboration with the government and the Bill and Melinda Gates Foundation. The purpose of the program is to make the sanitation sector attractive for climate finance and private investment, establish a linkage between sanitation and green growth at the municipal planning level, and develop business cases and service models for inclusive, resilient, and green sanitation services.²⁰⁶ Nepal's second NDC has set the targets that by 2025, 380 million litres/day of wastewater will be treated, and 60,000 cubic meters/year of faecal sludge will be managed, resulting in estimated 258 Gg CO2eq. reduction. That supports the government ambition to integrate the circular economy into inclusive municipal sanitation, with the plan to adopt and implement waste segregation, recycling and waste-to-energy programs in at least 100 municipalities by 2030. The way forward involves coordination among layers of government, filling policy and financing gaps, rolling out a WASH plan in local governments, coordinating at the sector level, and engaging the private sector in WASH.²⁰⁷

To address the problem of overflowing landfill space in Kampala, Uganda, a pilot project is collecting urban waste, which is fed to insect larvae, which are processed into high-quality livestock feed. The insects leave behind a valuable fertilizer. The pilot is carried out in partnership with the municipality and employs 27 youth. In the past year, some 400 tons of organic waste have been processed. The pilot reduces waste management costs by 85%, and lowers CO₂ emissions by 70%.²⁰⁸

Maximum Yield Technology (MYT) is an innovative process for treatment and utilization of residual household waste²⁰⁹. Developed in Germany, MYT extracts the complete raw material and energy content of waste and uses the energy potential as recyclable sources of energy. The process is being used or planned for use in several Asian countries, including at an MYT project in Nanbo, Indonesia.²¹⁰ Outputs

²⁰⁵ Khorn, Vuthy, Kep Municipalkity Deputy Governor, Cambodia.

²⁰⁶ Kansakar Luna K., GGGI.

²⁰⁷ Chirakar, Yogendra, Government of Nepal.

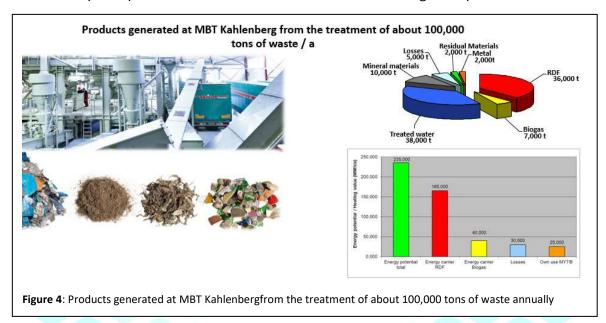
²⁰⁸ Straub, Philipp T., Proteen, Uganda.

²⁰⁹ Digital plant visitofMYT facilityin Germany:

https://www.youtube.com/watch?v=vPIYaU9EsbA&list=PLcVGMesWRpficcRzsc0sbutX3bTsXP5Ob

²¹⁰ Loskarn, Marc, EUWELLE Environmental Technology, Germany.

from this project include electricity, refuse derived fuel, soil improver, and treated wastewater. Figure 4 presents an example of products from MYT Process at the Kahlenberg MBT plant.



Barriers must be lifted to make circular models work for waste management. Key areas for action include political engagement and predictable regulatory frameworks, financial support, appropriate support infrastructure, behavioral change, and human resources. Adoption of regenerative, carbon-absorbing production, and a shift toward affordable, plant-based foods, would contribute to efficient use of resources. ²¹¹ One practical example of an innovation that reduces food and solid waste is the ECOBOX launched in Luxembourg three years ago. It is a reusable container for taking away unfinished meals.

GGGI collaborates with donors, the private sector and government counterparts to craft policies, develop bankable business models, and mobilize green investment for resource recovery and waste-to-energy facilities throughout the developing world. It has also developed public private partnership and sustainable business models to attract green investment into large-scale waste treatment infrastructure that turns waste into resources. These collaborations are contributing to the green transition in developing countries.

²¹¹ Weidenhaupt, André.

²¹² See: https://ecobox.lu/en/

ACKNOWLEDGEMENT

Speakers

- Kyung-Nam Shin, Assistant Director-General and Head, Investment & Policy Solutions Division, GGGI
- Nathalie André, Specialist, Sanitation Policy Solutions, GGGI
- Shomi Kim, Lead, Green Cities and Waste Management, GGGI
- André Weidenhaupt, Director General, Ministry of the Environment, Climate and Sustainable Development, Luxembourg
- Rieko Kubota, Senior Environmental Engineer, Environment, Natural Resources & Blue Economy, World Bank
- Chul Kang, Program Specialist, Climate Crisis and Pandemic Responses, KOICA
- Vuthy Khorn, Deputy Governor, Kep Municipality, Cambodia
- Luna K. Kansakar, Senior Program Officer, GGGI Nepal
- Yogendra Chirakar, Senior Divisional Engineer, Ministry of Water Supply, Nepal
- Philipp T. Straub, CTO, Proteen, Uganda
- Marc Loskarn, Project Engineer, EUWELLE Environmental Technology, Germany

Moderators

- Nathalie André, Specialist, Sanitation Policy Solutions, GGGI
- Shomi Kim, Lead, Green Cities and Waste Management, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-circular-economy-waste-management/.

LATIN AMERICA & CARIBBEAN SESSIONS

Overview of sessions

25 October 2021	26 October 2021	27 October 2021
Green Growth Measurement and Innovative Tools to Assess Performance in Sustainable Development Goals (SDGs)	Nature-based Solutions, Agroforestry Concessions and Sustainable Landscape initiatives	Greening LAC´s Financial Systems Experience from the banking sector and capital markets
Green Entrepreneurship: Innovative Business Models & Potential for Green Jobs Creation	Gre	obal een Growth eek 2021

Welcoming remarks by GGGI President & Chair H.E. Mr. Ban Ki-moon



Dear distinguished participants, Ladies and gentlemen,

It is my pleasure to welcome all of you—the moderators, speakers, panelists, and all participants—to this session of the Global Green Growth Week 2021 / for the Latin America and the Caribbean regions.

Although this year's GGGWeek will take place virtually due to the COVID-19 pandemic, / my hope is that it will be more "green", provide an opportunity for broader participation from more regions and sectors of the world, / and ultimately lead to bigger impacts.

Thanks to technological advances and recent practices of working virtually, / GGGWeek2021 will employ the "follow-the-sun" model of events across the global regions / and include a wide diversity of experts and presenters from all over the world.

Extreme weather changes continue to pose a threat to food and water security, infrastructure, and public health, along with the region's very rich natural ecosystems.

For the Latin America and Caribbean regions, much of the population is disproportionately affected by the pandemic and climate crisis.

The rate of sea level rise has doubled, and the region is experiencing intensified storms and hurricanes, making it more urgent than ever / to access green and climate finance.

Climate change is being felt everywhere—the islands, rain forests, and the mountains—in the region, and it is not just the extreme weather events and natural disasters.

We can read and hear—almost on a daily basis now—about how climate change fuels conflicts, spurs migration, and poses serious public health risks.

We must support the region's countries achieve their Nationally Determined Contributions and scale up their mitigation and adaptation efforts.

As experts and speakers of this session delve into key initiatives and solutions for the region—covering nature-based solutions, financial systems, circular economy, and green entrepreneurship—I hope all of you will give and take greater insights and discover new avenues for collaboration.

I am very pleased to express my appreciation for your valuable participation in this year's GGGWeek, and I wish each and every one of you all the best in strengthening existing partnerships and developing new ones.

Thank you. Muchas gracias.

Session details

31 Green Growth Measurement and Innovative Tools to Assess Performance in Sustainable Development Goals (SDGs)

Agenda

9:00-9:05 (5 minutes)	Opening Remarks (Video) Mr. Ban Ki-Moon, President and Chair, Global Green Growth Institute (GGGI)
9:05-9:10 (5 minutes)	Welcome Remarks, Introduction to Green Growth from GGGI's Perspective Ms. Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development Unit, GGGI, Seoul, South Korea
9:10-9:20	Welcome Remarks, Introduction to Green Growth from OECS' Perspective and
(10 minutes)	Session Overview
	Mr. Chamberlain Emmanuel, Head of Environmental Sustainability Division,
	Organisation of Eastern Caribbean States (OECS) Commission, Castries, Saint Lucia

First Round Presentations

Dr. Lilibeth Acosta

Dr. Ali Kerem Saysel

Panelists: Dr. Jose Pineda

[From global to national/sub-national green growth performance measurement]

9:20-9:30 (10 minutes)	Presentation I: GGGI's Green Growth Index and Simulation Tool Presenter: Dr. Lilibeth Acosta Program Manager, Green Growth Performance Measurement, GGGI, European Office,
	Budapest, Hungary
9:30-9:40 (10 minutes)	Presentation II: UNEP's Green Economy Progress Index Presenters: Mr. Chengchen Qian Consultant, Economic and Trade Policy Unit, United Nations Environment Programme (UNEP), Geneva, Switzerland Dr. Beibei Liu Professor, School of Environment, Nanjing University, Jiangsu Province, China
9:40- 10:00 (20 minutes)	Panel Discussion Q&A from panel and audience on the presentations Moderators: Mr. Chamberlain Emmanuel

Consultant, UNEP and Senior Advisor, Dev Tech Systems. Inc., Virgina, United States

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Professor, Institute of Environmental Sciences, Boğaziçi University, İstanbul, Turkey

Dr. János Abonyi

Professor, University of Pannonia, Veszprém, Hungary

10:00-10:05 Break

(5 minutes)

Second Round of Presentations

[Collection and application of databases to measure green growth]

10:05-10:15 Presentation III: Environment Statistics Self-Assessment Tool (ESSAT) for the OECS

(10 minutes)

region

Presenter:

Ms. Karina Cázarez

Assistant Project Manager, Division of Statistics, United Nations Economic Commission

for Latin America and the Caribbean (UN ECLAC), Mexico, Mexico

10:15-10:25 Presentation IV: Green Growth Measurement based on input-output models with a

(10minutes) case study of Morocco

Presenter:

Ms. Khaoula Houssini

School of Environmental Science and Engineering, Shanghai Jiao Tong University,

Shanghai, China

10:25-10:45 Panel Discussion

(20 minutes) Q&A from panel and audience on the presentations

Moderators:

Mr. Chamberlain Emmanuel

Dr. Lilibeth Acosta

10:45-10:55 Panelists' Reflection of Key Take Away for Green Growth Performance and

(10 minutes) Innovative Tools

Panelists:

Dr. Jose Pineda Dr. Ali Kerem Saysel Dr. János Abonyi

10:55-11:00 **Closing Remarks**

(5 minutes) Dr. Lilibeth Acosta

Summary

GGGI defines green growth as a development approach that seeks to deliver economic growth that is both environmentally sustainable and socially inclusive. Green growth is central to achieving the Sustainable Development Goals (SDGs). The measurement of green growth performance using innovative tools aligned to or benchmarked against SDG targets helps guide countries in their green growth transition

and achievement of the SDGs. Before GGGI launched the Green Growth Index²¹³ in 2019, there was no standardized approach to gauge the performance of green growth policies and actions.

The Green Growth Index is a composite index designed to track green growth performance in four interlinked dimensions of green growth – efficient and sustainable resource use, natural capital protection, green economic opportunities, and social inclusion (Figure 1). The Index is aligned with the SDGs, the Paris Agreement and Aichi Biodiversity Targets, and it is the first index to benchmark green growth performance against the targets of these international agreements. Over 300 experts from 40 countries were consulted during 2018-2019 before the Index was first published in 2019. Many of these experts have remained involved in the annual review of the Index, and GGGI continues to invite more experts to make the review as comprehensive and global as possible and ensure the relevance of the Index to national and regional policymaking.²¹⁴



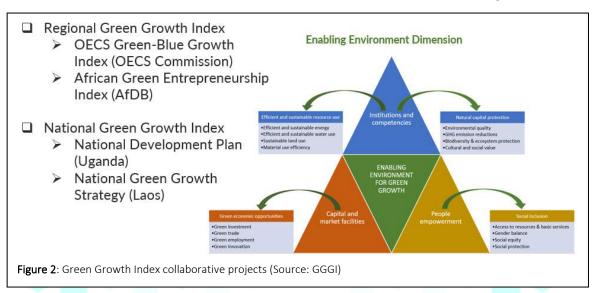
Complementing the Index is a Simulation Tool that estimates the impact of different policies on country performance. This further improves the policy relevance of the Index, and enhances knowledge on how different policy options across sectors influence a country's green growth performance. The Simulation Tool allows an interactive learning experience where decision-makers can manipulate input indicators, experiment with different policy choices, and simulate the impacts of their choices on green growth performance through the projected effects on output indicators.

In order to ensure the relevance, uptake and application of the Green Growth Index and Simulation Tool, GGGI has partnered with international and regional organizations like the Organisation of Eastern Caribbean States (OECS) Commission to develop the OECS Green-Blue Growth Index and apply the

²¹³ GGGI, "Green Growth Index," https://greengrowthindex.gggi.org/.

²¹⁴ Acosta-Michlik, Lilibeth. GGGI

Simulation Tool in selected OECS countries, and the African Development Bank to develop the African Green Growth Index and apply the Simulation Tool in selected African countries (Figure 2).



The Green Growth Index and Simulation Tool complement other frameworks and tools developed by United Nations agencies, such as those under the Partnership for Action on Green Economy (PAGE), by the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) and by various universities and research organizations.

As part of PAGE, the United Nations Environment Programme (UNEP) has developed two key products to support countries in the monitoring of their progress toward an inclusive green economy. The first is the Green Economy Indicator Guidance Manual that provides guidance on the use of indicators to evaluate policy options, and has been applied in Ghana, Mauritius and Uruguay. The second is the Green Economy Progress (GEP) Measurement Framework that enables countries to monitor progress toward achieving development priorities and allows for cross-country comparison. The framework has been applied in South Africa and China. Whereas the GEP Framework focuses more on progress and is based on future green growth pathways, the Green Growth Index focuses more on performance and is based on baseline (current) year and past trends. They therefore complement each other.²¹⁵

The GEP Framework has been tailored and applied at the provincial and city levels in two provinces of China – Jiangsu and Fujian, in partnership with Nanjing University and Fujian Normal University, respectively. For Jiangsu, a database of Jiangsu green economy has been developed to enable regular monitoring of the indicators developed based on the GEP Framework – the availability of stable and open channels of data is crucial to the success and sustainability of measuring progress. The design and selection of indicators for the provinces and cities is based on four principles: (1) the indicator system should cover all the perspectives of the transition to green development; (2) the indicator system should reflect the state of development in a comprehensive and targeted manner; (3) the indicators should be directly related to the assessment targets of the transition to green development; and (4) the indicators should be clear, specific, measurable and easily applied. Results of the scoring has helped local policymakers identify areas that are progressing well (e.g., in renewable energy uptake), and areas that require attention and

²¹⁵ Liu, Beibei. Nanjing University

investment (e.g., in addressing air pollution). The application of the GEP Framework has also allowed consistent, objective and transparent comparison of green development progress across cities.

The Green Growth Index also complements the scenario frameworks developed by IPBES to support policymaking. The Green Growth Index draws from IPBES' Nature Futures Framework that shifts traditional ways of forecasting impacts of society on nature to nature-centered visions and pathways that integrate interlinkages of social-ecological systems. In addition, the incorporation of cultural values in the Simulation Tool is being considered, although currently, there are limited indicators to measure them.

The Shanghai Jiao Tong University in China has developed a model to measure the green growth performance of Morocco from 2000 to 2018. The model is based on an input-output analysis framework that integrates the technique for order performance by similarity to ideal solution (TOPSIS) and the slack-based measures (SBM) method. The input indicators are related to energy, capital, labour and policy regulations, and the output indicators include both desirable dimensions (e.g., social welfare) and undesirable dimensions (e.g., environmental pollution). Results show a strong commitment of the Moroccan government in promoting green growth. However, the dependency on fossil fuels has led to increasing environmental costs.²¹⁶

These tools for measuring green growth aim to engage with policymakers and investors in a holistic manner to consider the multiple dimensions of transitioning to green growth and achieving SDG targets, and provide guidance in understanding both the co-benefits and tradeoffs of these different dimensions. The experience and insights from developing and applying these tools show the importance of the flexibility of the tools to cater to different contexts, levels (international to local), needs and agendas, as well as constraints, including the availability of data.

The lack of data for green growth measurement is a common constraint across countries. That is why tools like the Environment Statistics Self-Assessment Tool (ESSAT) are important to help countries assess and improve their environmental information systems that collect and collate the data needed. SSAT is developed by the United Nations Statistics Division in collaboration with the Expert Group on Environment Statistics. The tool is in the form of a questionnaire to guide a multi-stakeholder consultation and discussion to assess the current state-of-play of environment statistics in countries. The United Nations Economic Commission for Latin America and the Caribbean (ECLAC) has been working with OECS in applying ESSAT in selected Caribbean countries, and the common issues that have emerged include limited human and financial capacity of countries, the existence of data but they are often not available to the public or easily obtainable, or data may be available but they are not in friendly formats for data analysis.

Toward green COVID-19 recovery and transition to green growth, increased investment and efforts are needed within and across countries to enable data-driven decision-making in the design of green growth policies, strategies and investment plans. To support countries in COVID-19 recovery, GGGI is working on a Green Recovery Index to measure the greenness of policies and investments in green recovery packages using the Green Growth Index to baseline green performance.

²¹⁶ Houssini, Khaoula. Shanghai Jiao Tong University

²¹⁷ Cázarez-Grageda, Karina. United Nations Economic Commission for Latin America and the Caribbean (UN-ECLAC)

ACKNOWLEDGEMENT

Speakers:

- Dr. Jose Pineda, Consultant, UNEP and Senior Advisor, DevTech Systems, Inc., United States of America
- Ms. Ingvild Solvang, Deputy Director, Head of Climate Action and Inclusive Development Unit, GGGI
- Dr. János Abonyi, Professor, Department of Process Engineering, University of Pannonia, Veszprém, Hungary
- Dr. Ali Kerem Saysel, Professor, Institute of Environmental Sciences, Boğaziçi University, Istanbul, Turkey
- Mr. Chengchen Qian, Consultant, Economic and Trade Policy Unit, UNEP
- Dr. Beibei Liu, Professor, School of Environment, Nanjing University, China
- Ms. Karina Cázarez, Assistant Program Manager, Division of Statistics, ECLAC
- Ms. Khaoula Houssini, PhD Candidate, School of Environmental Science and Engineering, Shanghai Jiao Tong University, China

Chair and Moderator:

- Mr. Chamberlain Emmanuel, Head of Environmental Sustainability Division, OECS
- Dr. Lilibeth Acosta, Program Manager, Green Growth Performance Measurement, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-ndcs-green-growth-strategy-index/.

32 Green Entrepreneurship: Innovative Business Models & Potential for Green Jobs Creation

4	Agenda
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16:00-16:05 (5 minutes)	Special Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green	
	Growth Institute (GGGI)	
16:05-16:10 (5 minutes)	Opening Remarks and Introduction of Speakers Moderator: Kristin Deason, Representative, Caribbean, GGGI	
16:10-16:45 (35 minutes)	Presentations (5 minutes per presenter) Mr. Juan Pablo Bustamante, Senior Officer, Project Preparation Facility Management, GGGI - GGGI's experience in Green entrepreneurship in Colombia Ms. Laurah John, Program Officer, Eastern Caribbean Green Entrepreneurship Initiative, GGGI - GGGI's experience in Green entrepreneurship in the Caribbean Ms. Esther Bates, Senior Project Management Officer, GGGI & Ms. Laura John Program Officer, Eastern Caribbean Green Entrepreneurship Initiative	
	- GGGI's experience in Green entrepreneurship in the Pacific	
	Mr. Abdullah Khair, Strategic and Global Partnerships Manager, Student Energy	
	- Youth Innovation at the Forefront of Green Jobs	
	Ms. So-Min Cheong, Associate Professor, University of Kansas	
	- Entrepreneurship and New Energy Technologies	
	Ms. Slendy Diaz, CEO of ACTIVIST	
	 The role of a circular economy in competitiveness and green jobs. Mr. Juan Fernandez, Director of the Technological Center for Industrial Circular 	
	Economy of the Province of Buenos Aires, Argentina	
	- The green agenda in SMEs and how to be part of the green transition	
16:45-17:25 (40 minutes)	Panel Discussions	
	Chair: Kristin Deason	
17:25-18:00 (35 minutes)	Q&A	
,/	Chair: Kristin Deason	

Summary

Micro, small and medium-sized enterprises (MSMEs) make up 90% of our global economy and 50% of jobs – in emerging markets, they account for 70% of jobs. ²¹⁸ Green MSMEs and green entrepreneurs (or greenpreneurs) seek to address environmental and/or social issues through their business, while building wealth – putting people and planet at the center of their work. ²¹⁹ They play an important role in starting, accelerating and sustaining a green and circular economy by providing green products and services, introducing greener production techniques, boosting demand for green products and services, and creating green jobs. Green entrepreneurship can be related to the output (products and services) or the process (or production) of an economic activity. Usually, greenpreneurs consider both aspects in their business models, creating decent jobs with environmentally friendly processes, while reducing the overall climate impact as a result of people or companies using the final product or service. ²²⁰

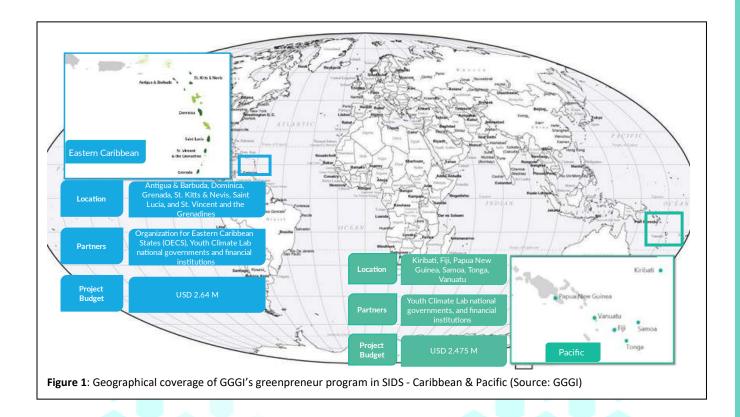
GGGI has been promoting green entrepreneurship through its global Greenpreneurs program, ²²¹ supporting greenpreneurs in starting up and growing their innovative ideas that contribute to their country's climate and sustainable development goals. GGGI's Eastern Caribbean Green Entrepreneurship Initiative and the Pacific Green Entrepreneurship Network are supporting marginalized greenpreneurs (particularly women and youth) in 12 small island developing states (SIDS) in Eastern Caribbean and the Pacific. These SIDS are highly vulnerable to climate change and have high youth unemployment rates. Both these initiatives, funded by the Qatar Fund for Development, aim to support the countries' green recovery as they emerge out of the COVID-19 crisis, which presents opportunities to promote economic diversification and resilience, and green and inclusive job creation by developing a green entrepreneurial ecosystem.

GGGI's Greenpreneurs program has three main components: (1) a 12-week incubator program that provides training and mentoring to early-stage greenpreneurs with the opportunity to participate in a competition to secure grant seed funding of up to \$10,000; (2) an accelerator program that targets growth-stage ventures to scale their business through zero-interest financing of up to \$50,000 and by matching greenpreneurs with investors; and (3) developing an entrepreneurship ecosystem in countries that can sustainably support greenpreneurs beyond the life of the program (Figure 1).

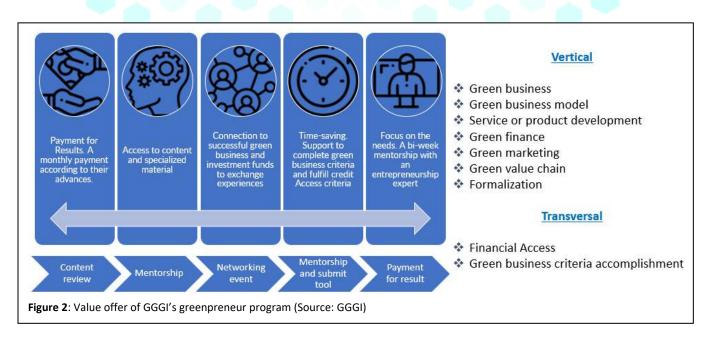
²¹⁸ Bates, Esther and John, Laurah. "The Eastern Caribbean Green Entrepreneurship Initiative & The Pacific Green Entrepreneurship Network," presentation made at Global Green Growth Week 2021, 25 October 2021. ²¹⁹ Ibid.

²²⁰ International Labour Organization, "Green entrepreneurship: Creating green jobs through sustainable enterprise development," https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---emp_ent/documents/publication/wcms_250688.pdf.

²²¹ GGGI, "Greenpreneurs," https://gggi.org/global-program/greenpreneurs/.



GGGI also has a Greenpreneurs Program in Colombia that supports greenpreneurs and green enterprises at all stages of the value chain, including green business model development, product or service development, financing, marketing, upscaling, and the provision of training, mentoring and networking opportunities (Figure 2). To motivate entrepreneurs to complete the eight-month program and engage in continuous learning, a payment for results approach is used. GGGI has selected 15 greenpreneurs to support out of 309 applicants. Among the 15 greenpreneurs, six are women and one is from an indigenous



community. So far, the program is in its fifth month and all greenpreneurs have remained committed to the program.

Green entrepreneurship provides an opportunity to jumpstart the circular economy. The transition to a circular economy represents a redefinition of growth, from the prevalent linear economic system in which we make, use and then dispose of products and materials to a more sustainable system. Governments around the world are encouraging – and, in some cases, requiring – the adoption of circular economy principles that lead to higher resource efficiency and less waste. A circular economy aims to design out waste and pollution, and keep products and materials in use along the value chain through 9Rs – rethink, reduce, reuse, repair, refurbish, remanufacture, repurpose, recycle and recover.

The Technological Center for Industrial Circular Economy is supporting the province of Buenos Aires, Argentina in engaging with MSMEs in the transition to a circular economy through training and technology transfer along the value chain, developing sustainable business models for circular economy enterprises, and promoting industrial symbiosis and collaboration.

During the COVID-19 pandemic with the closure of borders, countries have focused on local productions, which represent an opportunity to grow the entrepreneurial ecosystem and promote sustainable production and consumption. New green enterprises and innovations have emerged particularly in the food and agriculture sectors. However, there has been a noticeable lack of greenpreneurs in the energy sector. One of the reasons may be because the energy sector has traditionally been dominated by large energy firms. But this is changing, and there are growing opportunities for entrepreneurial activities as the energy sector transitions to smaller, distributed and modular systems that are more dependent on advanced digital technologies such as Internet of Things and artificial intelligence.

Another key barrier for greenpreneurs in the energy sector, identified by global research conducted by Student Energy, is the lack of financing – with findings showing that 82% of young entrepreneurs regard the lack of financial support as the main barrier to making entrepreneurship feasible. Student Energy works with a network of 50,000 young people from over 120 countries to build the knowledge, skills and networks to accelerate the transition to sustainable energy. In June 2021, Student Energy launched the ambitious Student Energy Solutions Movement to mobilize USD150 million to support the deployment of 10,000 youth-led clean energy projects by 2030, and train 50,000 agile and employable youth workers, with a particular focus on reducing the energy skills gap in developing nations, and for women. This movement is based on the findings from their global research and the rising demand for Student Energy's training programs in green entrepreneurship and career enhancement, as well as in developing digital skills in line with the digitalization of the energy sector and the overall economy.

Green entrepreneurial growth lies at the heart of countries' green recovery and transition to a green economy, with the potential to create innovative solutions, accelerate the creation of green jobs and drive change. Multi-stakeholder collaboration with government, civil society and the private sector is key in cocreating an ecosystem for greenpreneurs through initiatives such as GGGI's Greenpreneurs Network, to nurture a green business culture, raise awareness on green business models, increase access to technical and financial support, and promote upskilling, reskilling and continuous learning to leverage green entrepreneurship and green job opportunities.

²²² Khair, Abdullah. "Student Energy Solutions Movement: Scaling Youth-led Innovation for Green Jobs," presentation made at Global Green Growth Week 2021, 25 October 2021.

ACKNOWLEDGMENT

Speakers:

- Juan Pablo Bustamante, Senior Officer, Project Preparation Facility Management, GGGI
- Laurah John, Project Officer, GGGI
- Esther Bates, Senior Project Management Officer, GGGI
- Abdullah Khair, Strategic and Global Partnerships Manager, Student Energy
- So-Min Cheong, Associate Professor, University of Kansas
- Slendy Diaz, Chief Executive Officer and Founder, Activist
- Juan Fernandez, Director, Technological Center for Industrial Circular Economy, Province of Buenos Aires, Argentina

Moderator:

• Kristin Deason, Representative, Caribbean, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek-2021-green-entrepreneurship-green-jobs-green-recovery/.

33 Nature-based Solutions, Agroforestry Concessions and Sustainable Landscape initiatives

4	Agenda
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10:00-10:05 (5 minutes)	Special Remarks H.E. Ban Ki-moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)
10:05-10:10 (5 minutes)	Opening Remarks and Introduction of Speakers (Part1) Mr. Alberto Dante Maurer Fossa, Country Representative, GGGI, Peru
10:10-10:30 (20 minutes)	Presentation 1 Dr. Valentina Robiglio, Scientific coordinator of World Agroforestry (ICRAF) Mr. Jose Luis Capella, Director of the Forest and Ecosystem Service Program of the Peruvian Society for Environmental Law (SPDA) - The Experience of AgroFor: Consortium for the Promotion of AgroForestry Concessions in Peru
10:30-10:50 (20 minutes)	Presentation 2 Ms. Tatiana Escovar, Subnational Coordinator, GGGI Colombia - Lessons learned from GGGI-Norway collaboration in Colombia
10:50-11:10 (20 minutes)	Presentation 3 Mr. David Fernandez, Guyana Program Lead, GGGI Colombia - GGGI's Support to the Guyana REDD+ Investment Fund (GRIF)
11:10-11:40 (30 minutes)	Panel Discussions Chair: Mr. Alberto Dante Maurer Fossa Panel: - Ms. Aura Robayo, Advisor climate and forests at Royal Norwegian Embassy in Colombia - Mr. Luis Miguel Aparicio, Regional Lead, Forest, and Land use - Business Development, GGGI - Ms. Tatiana Escovar - Dr. Valentina Robiglio - Mr. Jose Luis Capella
11:40-11:50 (10 minutes) 11:50-11:55 (5 minutes)	Break Opening Remarks and Introduction of Speakers (Part2) Mr. Pablo Martinez, Country Representative, GGGI, Colombia

11:55-12:10 (15 minutes)	Presentation 4 Mr. Carlos Reinoso, General Manager, Eco-systems Group SAS, Colombia Mr. Mohammad Hassain, CTO, Eco-Systems Group SAS, Colombia - Sustainable Mariculture & Potential to GHG Reduction: Lessons learned from "Project Blue- Treasures" in Colombia
12:10-12:25 (15 minutes)	Presentation 5 Mr. Fernando Balsevich, International Consultant and Professor at Universidad Nacional de Asunción (UNA) & Universidad Nacional de Itapúa (UNI) - Forestry industry and energy generation for sustainable poverty reduction
12:25-12:40 (15 minutes)	Q&A Chair: Mr. Pablo Martinez
12:40-12:45 (5 minutes)	Closing Remarks Mr. Pablo Martinez

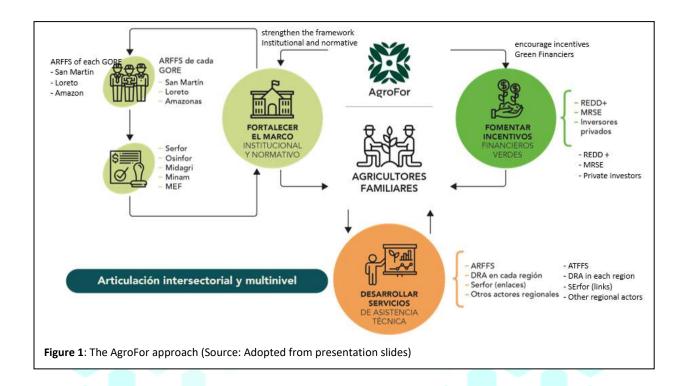
Summary

Nature-based solutions are actions to protect, sustainably manage, and restore natural or modified ecosystems that address societal challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits. Nature-based solutions and related innovative approaches have garnered significant interest and momentum in Latin America and worldwide, with evidence of these solutions benefiting the economy, society and environment.

In Peru, the AgroFor Project is an innovative approach to reduce deforestation and restore forest ecosystems by promoting sustainable agroforestry practices, securing land rights of family farmers in the Peruvian Amazon and improving their livelihoods (Figure 1). The project is an initiative of GGGI, World Agroforestry (ICRAF) and the Peruvian Society of Environmental Law (SPDA) with financial support from the Norwegian Climate and Forest Initiative that is working to provide technical, legal, financial and institutional support to the Peruvian government in implementing the agroforestry concessions (ACs) system. ACs are a type of contract or land tenure mechanism (concessions) recognized in the Forest Law that formalizes forest productive practices carried out by family farmers in designated areas. AC contracts are awarded to family farmers over areas covering a maximum of 100ha for a period of 40 years (may be renewed), and state rights, access to benefits and obligations of holders. The contract requires certain conditions to be met – to preserve forests by using them in a sustainable way, to establish or maintain agroforestry concessions, and to implement good soil and water conservation practices. It is estimated that 123,000 households could potentially benefit in Peru and up to 20% of greenhouse gas (GHG) emissions could be reduced with successful nationwide AC implementation. 224

²²³ Robiglio, Valentina. LATAM World Agroforestry (ICRAF) & Capella, José Luis. Peruvian Society of Environmental Law (SPDA)

²²⁴ AgroFor, "About Us: The Context," https://www.agrofor.info/en/about-us/the-context/.



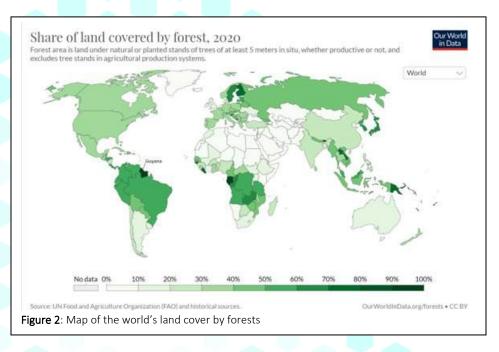
In Colombia, GGGI and the Kingdom of Norway are strengthening the capacity of government at national and subnational levels in Antioquia, Meta, Nariño, Corpoamazonia and Guaviare to implement deforestation control and prevention measures, and scale inclusive sustainability projects that promote nature tourism, sustainable livestock, non-timber forest products and the forestry economy. A Project Preparation Facility (PPF) is being established to support the structuring of environmentally and socially sustainable projects aligned with the priorities and potentials of the regions, and connect projects with financial sources. Through facilitating the investment of mixed resources, the PPF is expected to mobilize at least \$30 million of green investment, with an eventual handover of this facility to the Colombian government. The project also aims to build the capacity of the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM) and associated institutions to effectively monitor deforestation reduction toward achieving zero deforestation by 2030. A key lesson from the project is the importance of adopting a participatory multi-stakeholder approach at different levels with a diversity of players from the public and private sector and civil society to mobilize commitment, resources and expertise for deforestation reduction.

Also in Colombia, Eco-Systems Group SAS is supporting the transition to a low-carbon economy through ocean-based solutions to control global warming and ocean acidification and improve the livelihoods of indigenous coastal communities most vulnerable to climate change; as well as reduce emissions in the livestock sector that produces 26% of Colombia's total GHG emissions, particularly cattle that produces 95% of livestock sector emissions.²²⁵ Its Project Blue-Treasures is introducing an innovative and sustainable business model that leverages the opportunities of Colombia's ocean and marine resources and biotechnology to address these climate and socioeconomic challenges in an integrated manner. For

²²⁵ Hassain, Mohammad. "Sustainable Mariculture and Potential to GHG Reduction: Lessons Learned from Project Blue-Treasures in Colombia," presentation made at Global Green Growth Week 2021, 26 October 2021.

instance, the sustainable cultivation of algae crops for inclusion in cattle feeds could reduce over 80% of the methane produced by cattle, and at the same time improve cattle nutrition levels. In addition, the algae cultivated could be used for a variety of cosmetic and food products. This initiative is being piloted in La Guajira and Tierrabomba, with interventions aimed at mobilizing resources, establishing research and innovation centers, and building entrepreneurial and technical capacities to manage self-sustaining marine farms/permaculture and other mariculture projects.

Guyana has the world's second highest percentage of forest cover and is working with partners, including GGGI, to sustain 99.5% of that forest while building the foundation for a low-carbon and climate-resilient economy.²²⁶



GGGI is supporting the government of Guyana as part of the Green Climate Fund Readiness and Preparatory Support Programme. The program involves development of Guyana's National Climate Finance Strategy, improvement of its national monitoring, reporting and verification (MRV) system, and development of a pipeline of projects in line with meeting the country's nationally determined contribution (NDC) targets. The majority of the climate finance received by Guyana has been in the form of grants – 90% of the total climate funding is from the Guyana REDD+ Investment Fund (GRIF),²²⁷ which was created in 2009 to finance activities identified under the Low Carbon Development Strategy (LCDS). Project implementation, however, has been slow due to limited capacity and the lack of MRV by the GRIF technical secretary.²²⁸ In order for Guyana to implement climate actions, track their impact and achieve its NDCs, the country needs to enhance and diversify its long-term access to climate finance, strengthen coordination mechanisms among key stakeholders, and improve the quality of data management and reporting. Currently, a draft LCDS 2030 has been developed and shared with the public for comments. The LCDS 2030 aims to enable access to market-based mechanisms for forest climate services that

²²⁶ Government of Guyana, "Low Carbon Development Strategy: Executive Summary," https://lcds.gov.gy/executive-summary/.

²²⁷ GCF Readiness Proposal, "Development of Guyana's National Climate Finance Strategy, MRV System and Project Pipeline to Support NDC Implementation," December 2019, https://www.greenclimate.fund/sites/default/files/document/guyana-gggi.pdf.

²²⁸ Fernandez, David. "Guyana REDD + Investment Fund (GRIF) Experience," presentation made at Global Green Growth Week 2021, 26 October 2021.

includes private and international public sector financing. Plans for LCDS 2030 include the move to a carbon market and monetization of ecosystem services related to water management and biodiversity. The expected opportunity to access a market mechanism for forest climate services and other ecosystem services will enable Guyana to store 19.5 billion tons of CO_2e .²²⁹

In Paraguay, the Poverty, Reforestation, Energy and Climate Change Project (PROEZA) that started in 2018 is another innovative project that promotes a holistic sustainable landscape approach. PROEZA involves the collaboration of six line agencies responsible for agriculture, forestry, social protection, indigenous peoples, environment and energy that have agreed to collectively reduce rural poverty, combat deforestation and mitigate GHG emissions. PROEZA aims to support the transition to sustainable forest management to reduce the country's loss of forest cover and improve the quality of life of 17,000 vulnerable families in 64 municipal districts located in eight departamentos of Eastern Paraguay. Many of the beneficiaries are from indigenous communities. PROEZA is jointly developed by the Food and Agriculture Organization and the Government of Paraguay, and funding is from a \$25 million Green Climate Fund grant and \$65.2 million of co-financing from the government. A key element of PROEZA is to enable the poorest households to produce food while adopting low emission and climate resilient methods through the government's social protection scheme. In addition, the project is promoting the entry of small and medium landowners in the regional bioenergy market. To achieve this, concessional credit with national resources will be provided to private landowners to promote the establishment of 24,000ha of New Generation Forest Plantations and will include over 4,800ha of riparian protection forests to protect water courses.

Despite the potential of these innovative solutions to address climate and socioeconomic challenges, nature-based solutions, agroforestry concessions and sustainable landscape initiatives are neither consistently implemented nor adequately financed. Toward green COVID-19 recovery and transition to green growth, accelerated efforts are needed to develop local talent and share knowledge, adopt a holistic approach and promote multi-stakeholder collaboration, and continue to develop an enabling regulatory environment for nature-based solutions, agroforestry concessions and sustainable landscape initiatives. Moreover, self-sustaining business models that retain profitability are needed for these initiatives that are not solely dependent on development and research grants.

²²⁹ Government of Guyana, "Low Carbon Development Strategy: Executive Summary," https://lcds.gov.gy/executive-summary/.

ACKNOWLEDGEMENT

Speakers:

- Dr. Valentina Robiglio, Senior Scientist in Land Use Systems, World Agroforestry
- Mr. Jose Luis Capella, Director, Forest and Ecosystem Service Program, SPDA
- Ms. Tatiana Escovar, Subnational Coordinator of Colombia, GGGI
- Mr. David Fernandez, Guyana Program Lead, GGGI
- Aura Robayo, Advisor for Climate and Forests, Royal Norwegian Embassy in Colombia
- Mr. Mohammad Hassain, Chief Technology Officer, Eco-Systems Group SAS, Colombia
- Mr. Fernando Balsevich, International Consultant and Professor, Universidad Nacional de Asunción and Universidad Nacional de Itapúa

Chair and Moderator:

- Mr. Alberto Dante Maurer Fossa, Country Representative of Peru, GGGI
- Mr. Pablo Martinez, Country Representative of Colombia, GGGI

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34 Greening LAC's Financial Systems: Experience from the banking sector and capital markets

Agenda

09:00-09:10

Welcoming remarks

(10 minutes)

 H.E. Ban Ki Moon, President of the Assembly and Chair of the Council, Global Green Growth Institute (GGGI)

09:10-10:45 (95 minutes)

High-Level Panel: Greening LAC's Financial Systems: experience from the banking sector and capital markets

Chair: Ms. Marianna Lara, Climate Finance Specialist, GGGI
10 minutes presentation by each panelist / 40 minutes panel discussion

Panelists:

- Mr. José Antonio Quesada, Vice President of Regulatory Policy, National Banking and Securities Commission of Mexico (CNBV)
 - Mexico's Efforts towards a more sustainable financial system
- Ms. Sandra Guzman Luna, Co-founder, Latin America and the Caribbean Finance Group, GFLAC
 - Actions and perspective of civil society for the greening of the financial system
- Ms. Guadalupe Pizarro, Director of the Directorate of Management of Financial Investments and Capital Markets of the General Directorate of the Public Treasury
 - Peru's sovereign sustainable bond framework
- Ms. Soffia Alarcon, Head of LATAM, IHS Markit Regional ESG Trends
- Ms. Jenny McInnes, Deputy Director International Climate Finance
 - UKPACT actions in the region to support the greening of the financial system

10:45-11:55 (10 minutes)

Closing: Ms. Marianna Lara, Climate Finance Specialist, GGGI

Summary

Climate change, extreme climate events, economic crises and global pandemics are risks for economies, businesses and financial institutions. These institutions need to be prepared for these risks so they can both reduce them (and contribute to climate and sustainable development targets), and manage them to maintain profitability. With these rising risks and their negative impact on investment returns affecting the Latin America and Caribbean (LAC) region, regulators, investors, banks and borrowers are increasingly focused on assessing their climate-related and environmental, social and governance (ESG) risk exposures, as well as measuring their ecological and social footprint.

Entities in the financial ecosystem of LAC play a key role in contributing to a low-carbon and climate-resilient economy. Financial institutions have a responsibility to back their government's commitments under the Paris Agreement, and by recognizing and managing climate risks, they can be a driving force for positive change. Currently, however, only 2% of the world's largest banks conduct climate risk assessments and monitor their "financed emissions", which are emissions induced by bank loans and investments in companies that emit greenhouse gases. ²³⁰ In Latin America, only 37.5% of companies listed report on sustainability, and only 1% adhere to the Task Force on Climate-related Financial Disclosures (TCFD) reporting. ²³¹

Nevertheless, efforts are underway in some LAC countries to accelerate the greening of financial systems, especially through regulations and capacity building. In Mexico, green finance has been gaining momentum, with the Mexican Banking Association's launch of a sustainability protocol in 2016, and the establishment of the Green Finance Advisory Council (CCFV) in 2017 to promote green markets. Policymakers and regulators are increasingly encouraging banks, investors and companies to incorporate and disclose ESG aspects. The Network for Greening the Financial System, launched in 2017, has been highlighting the importance of managing climate risks and mobilizing capital for green, low-carbon investments. As of January 2022, the Mexican pension funds (AFOREs) will be mandated to analyze and report ESG aspects in their investment and risk management strategies.²³²

GGGI is supporting Mexico in accelerating green finance flows through capacity building of Mexico's financial regulator – National Banking and Securities Commission (CNBV) – with funding support from UK PACT. More specifically, the project is generating reports on best practices from regulators to promote the disclosure of ESG standards and the integration of climate risks into financial products and services, facilitating the exchange of best practices with national and international stakeholders, coordinating an internal campaign to raise awareness within CNBV on the greening of Mexico's financial sector, and developing a self-assessment tool for financial institutions to know where they are and what is needed to advance their ESG efforts. The project will increase awareness and capacities on ESG standards and climate risks, enabling CNBV to develop relevant regulation. This regulation, in turn, is expected to accelerate the integration of ESG and climate risks into financial sector operations and increase financial flows for projects that support climate commitments.

GGGI is also working with Nacional Financiera (NAFIN), one of Mexico's leading development banks that has been supporting the government's climate agenda and transition to a low-carbon economy. In November 2021, NAFIN published its Sustainability Bond Framework that allows the institution to issue green, social and sustainability bonds in alignment with Sustainable Development Goal targets, and allocated MXN7.8 billion of sustainable debt in the local market. This transaction is the first of its kind and is one of the most well received by the market with local investors' participation.²³³ NAFIN's Sustainability Bond Framework is aligned to best international market practices and to the International Capital Market Association (ICMA) Guidelines for Sustainable Bonds 2021. Moreover, the Framework received a

²³⁰ Alarcón Díaz, Soffia. "Greening the Financial Systems: The Experience from LATAMs Banking Sector and Capital Markets," presentation made at Global Green Growth Week 2021, 27 October 2021.
²³¹ Ibid.

²³² Quesada Palacios, José Antonio. "Sustainable Finance," presentation made at Global Green Growth Week 2021, 27 October 2021.

²³³ GGGI, "Mexican development bank Nacional Financiera (NAFIN) allocates MXN \$7.8 billion of sustainable debt in the local market," 30 November 2021, https://gggi.org/mexican-development-bank-nacional-financiera-nafin-allocates-mxn-7-8-billion-of-sustainable-debt-in-the-local-market/.

favorable Second Party Opinion from Sustainalitycs, the leading external reviewer of thematic bond frameworks.

In Peru, the Ministry of Economy and Finance officially approved the country's Sustainable Bond Framework (Ministerial Resolution N° 221-2021-EF/52) in July 2021, which establishes principles and recommendations for the governing and issuance process of bonds, aligned with the stringent standards of the ICMA. Peru's new Sustainable Bond Framework is the result of the leadership of the Ministry of Economy and Finance and its commitment to green finance. The General Directorate of the Treasury spearheaded this work and is supported by the National Competitiveness and Productivity Council. GGGI provided technical assistance under a project financed by the UK PACT. This green finance instrument will be key in supporting Peru's increased climate ambition and post-pandemic recovery. The first sustainable bond under this new framework is planned for issuance soon, with added emphasis on governance, traceability, and transparency to increase investor confidence.

The UK has been at the forefront of the growth of green finance, and its 2021 Greening Finance Policy Paper sets out the UK's ambition to green the global financial system. The UK established the first Green Finance Institute in 2019 that is driving the mainstreaming of green finance domestically and internationally, and in the same year announced plans to double its provision of international climate finance to GBP11.6 billion over the period 2021-2025. UK PACT is the UK's flagship bilateral technical assistance program to provide demand-driven and targeted capacity building to accelerate low-carbon transitions. The LAC program that started in Colombia and Mexico has been extended to Argentina, Brazil and Peru. A third of the GBP70 million program has focused on green finance, and the government has announced plans to increase funding for UK PACT to at least GBP200 million from April 2022.²³⁴

In order to monitor and report national and international revenues and expenditures associated with climate change and sustainable development, the Climate Finance Group of Latin America and the Caribbean developed a Sustainable Finance Index.²³⁵ The Index guides countries in identifying gaps and opportunities for greening financial systems, as well as encourages both the public and private sectors to mainstream climate change considerations and increase financial transparency. The Index is made up of four variables – sustainable income, carbon intensive revenues, sustainable budgets and carbon intensive budgets – which when integrated give the ranking score for each country. The first edition of the Index in 2020 analyzes 21 countries in LAC. One notable trend identified from the Index is that countries with the highest CO₂ emissions from fossil fuel combustion are those with the lowest sustainable finance levels, such as Argentina, Brazil and Mexico. In contrast, those with lower CO₂ emissions tend to have more sustainable finance, such as Honduras, Costa Rica and Nicaragua.

Overall, LAC's green finance market is growing rapidly. Regulators, investors, banks and borrowers have collaborated to create new financial instruments, such as sustainability-linked loans and bonds, designed to provide greater flexibility while incentivizing companies to meet and exceed their climate and ESG objectives. As demands for ESG transparency grow, and regulatory frameworks become more developed, ESG standards will increasingly be included in financing arrangements. Toward green COVID-19 recovery and transition to green growth, it is more important than ever that regulators, investors, banks and borrowers mainstream climate and ESG considerations in their policies and operations, and develop

²³⁴ McInnes, Jenny. "Greening LAC's Financial Systems: UK Government Assistance," presentation made at Global Green Growth Week 2021, 27 October 2021.

²³⁵ Climate Finance Group for Latin America and the Caribbean, "Sustainable Finance Index," https://www.sustainablefinance4future.org/indice-de-finanzas-sostenibles.

internal competencies to assess and manage risks associated with climate change. This includes incorporation of the TCFD recommendations, which will increase financial stability, help manage climate risks and opportunities, accelerate reallocation of capital toward climate-aligned investment opportunities, and incentivize corporate actions to achieve climate commitments. First movers will be in a stronger position to take advantage of and benefit from the opportunities that the transition to green and low-carbon economies presents.

ACKNOWLEDGEMENT

Speakers:

- Ferruccio Santetti, Regional Investment Lead, GGGI
- José Antonio Quesada Palacios, Vice President of Regulatory Policy, National Banking and Securities Commission of Mexico (CNBV)
- Sandra Guzman Luna, Co-Founder, Climate Finance Group of Latin America and the Caribbean
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- Soffía Alarcón Díaz, Head of Latin America and Sustainable Finance, IHS Markit
- Jenny McInnes, Deputy Director of International Climate Finance, UK Government Department for Business, Energy and Industrial Strategy

Chair and Moderator:

• Marianna Lara, Climate Finance Specialist, GGGI

For more details, including the recording of the session, please visit: https://gggi.org/gggweek2021-green-finance-carbon-pricing/.



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