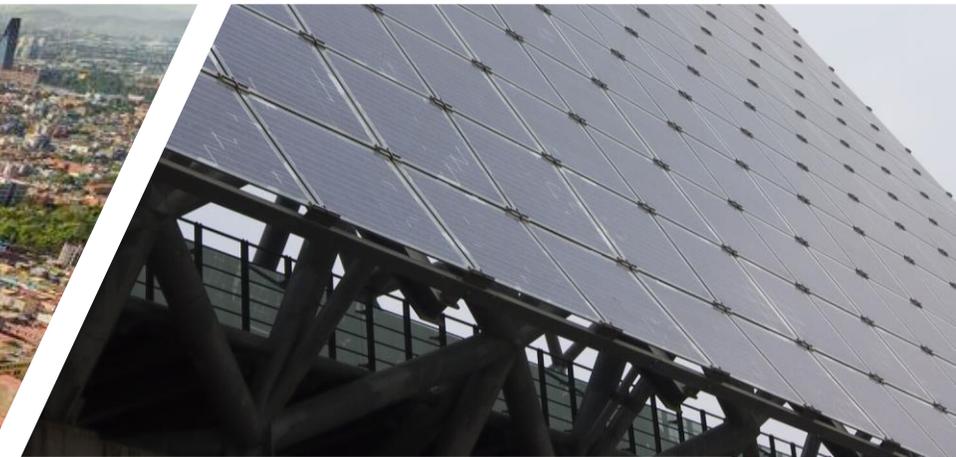




# Accelerating Green Growth as the Driver for Sustainable & Inclusive Economic Development

**WTO – Aid for Trade: Sustainable Development and the Green Economy**

Orestes Anastasia, Global Green Growth Institute – February 5, 2019



# Overview



About GGGI



Megatrends, planetary change, and development challenges



The case for green growth



GGGI's approach



Green growth in action: cases from the field



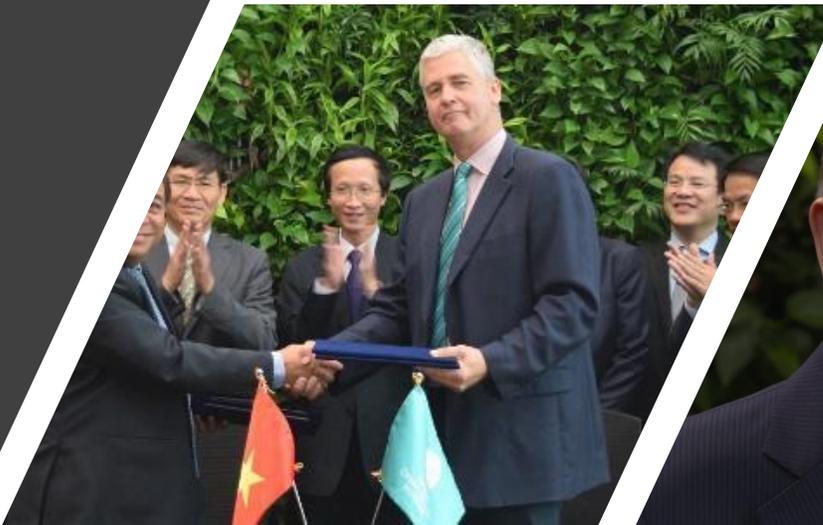
Global  
Green Growth  
Institute

# About GGGI

# GGGI at a Glance



- GGGI is a treaty-based international, inter-governmental organization dedicated to supporting and promoting **strong, inclusive and sustainable economic growth** in developing countries and emerging economies.
- GGGI supports a “**green growth transformation**” that also promotes deep decarbonization and climate resilience



# GGGI at a Glance



Headquartered  
in Seoul,  
Republic of  
Korea, GGGI has  
30 members with  
operations in  
30 countries



## Member Countries

Australia, Burkina Faso, Cambodia, Costa Rica, Denmark, Ethiopia, Fiji, Guyana, Hungary, Indonesia, Jordan, Kiribati, Republic of Korea, Lao PDR, Mexico, Mongolia, Norway, Papua New Guinea, Paraguay, Peru, Philippines, Qatar, Rwanda, Senegal, Thailand, Tonga, United Arab Emirates, United Kingdom, Vanuatu, Viet Nam

## Operations

Burkina Faso, Cambodia, China, Colombia, Costa Rica, Ethiopia, Fiji, Guyana, Hungary, India, Indonesia, Jordan, Kiribati, Lao PDR, Mexico, Mongolia, Morocco, Mozambique, Myanmar, Nepal, Papua New Guinea, Peru, Philippines, Rwanda, Senegal, Thailand, Uganda, United Arab Emirates, Vanuatu, Viet Nam



Global  
Green Growth  
Institute

# Megatrends, planetary change, and development challenges

# Key megatrends to 2030



## SOCIAL

- **Population growth** to 8+ billion, mostly in Africa and Asia
- Continued rapid **urbanization**
- Near elimination of **extreme poverty**
- Unprecedented global income **inequality**



## ECONOMIC

- Economic surge towards **Asia**
- **China** becomes world's largest economy in 2026
- **4th industrial revolution**
- Spread of **industrialization** in developing countries



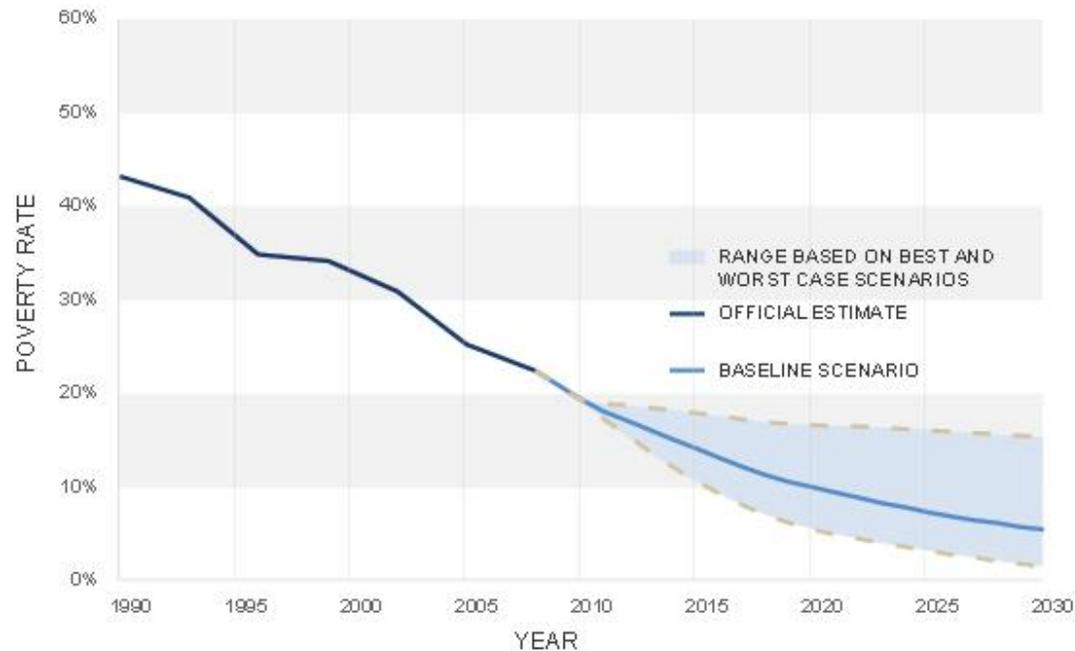
## ENVIRONMENTAL

- **Climate change** impacts
- Continued air, water, land, and ocean **pollution**
- Continued large-scale **biodiversity** and ecosystem loss
- Environmental **refugees** (?)

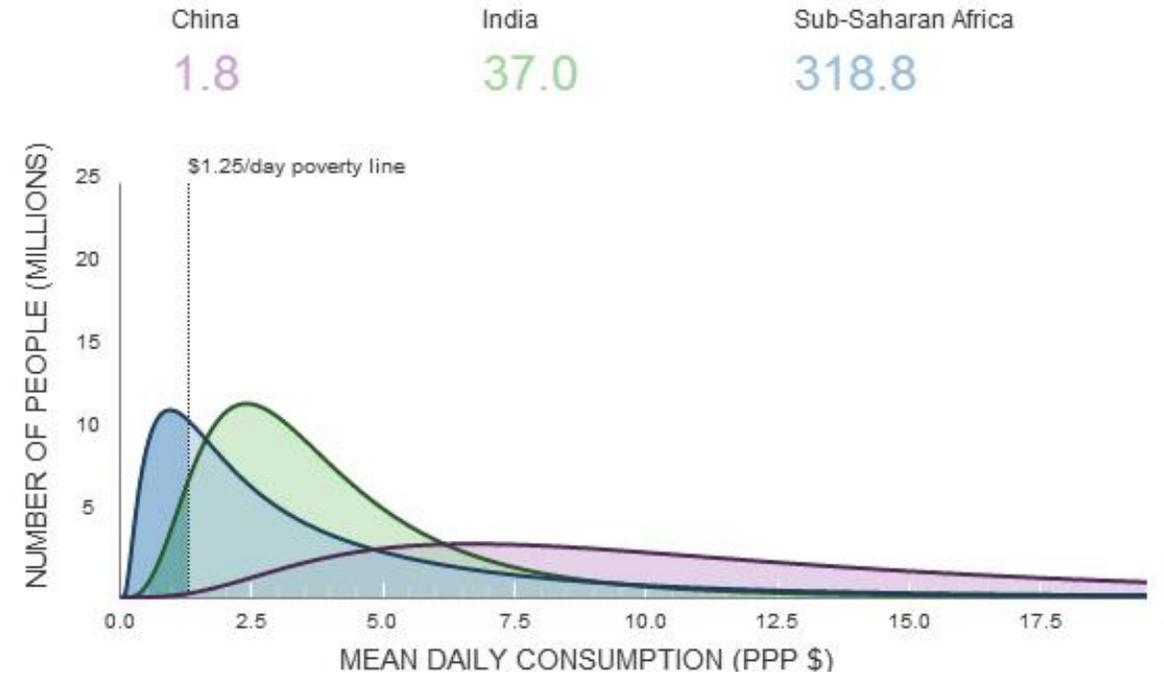
# Some extreme poverty will continue beyond 2030



Global poverty trajectory based on alternative scenarios for consumption growth and distribution

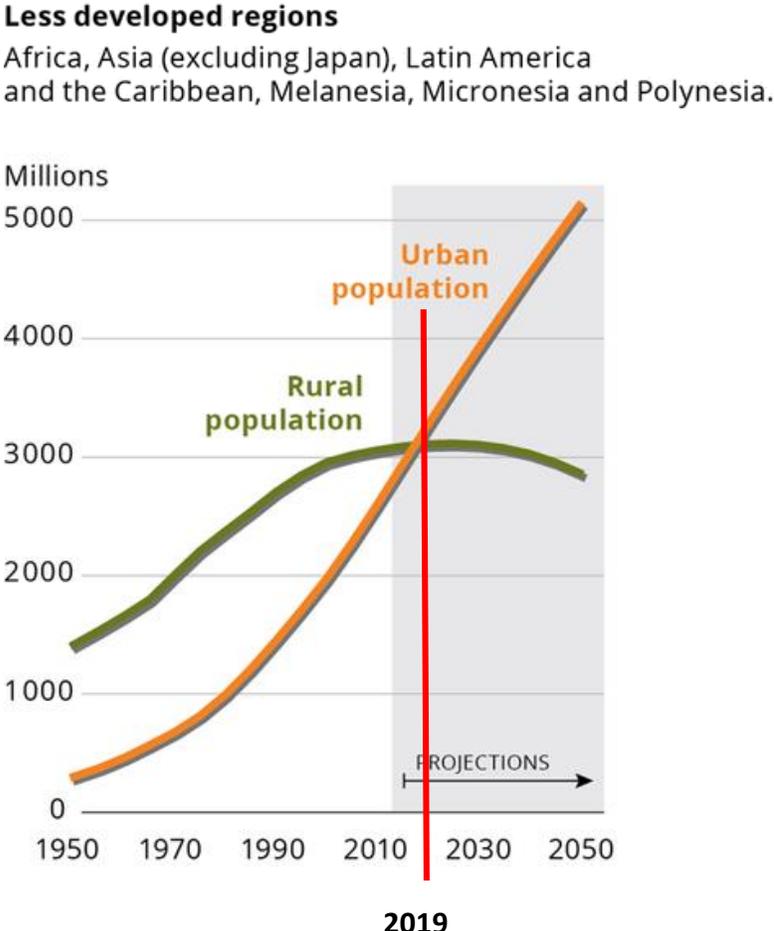
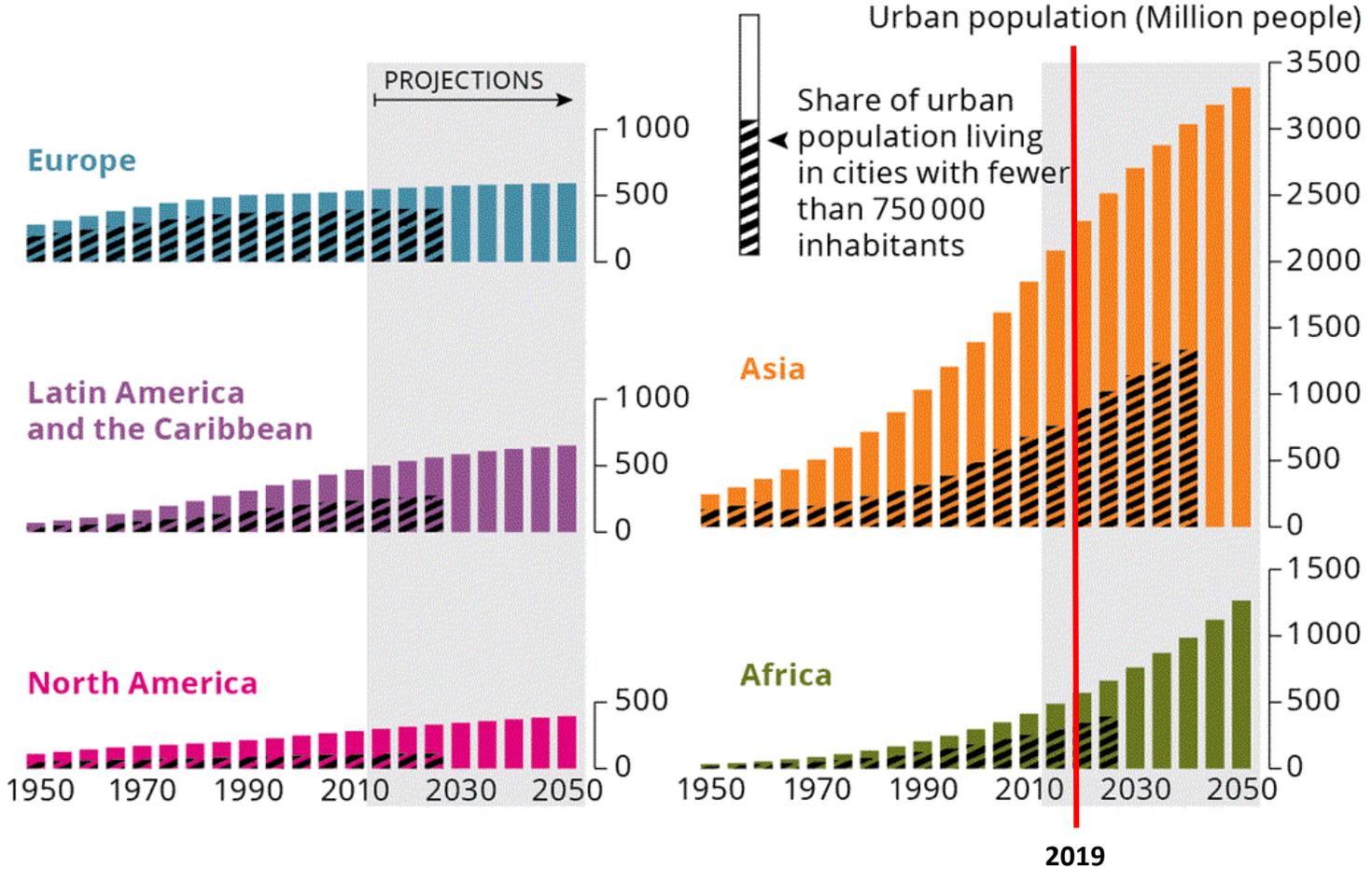


2030 Number of people living in extreme poverty, in millions (baseline)



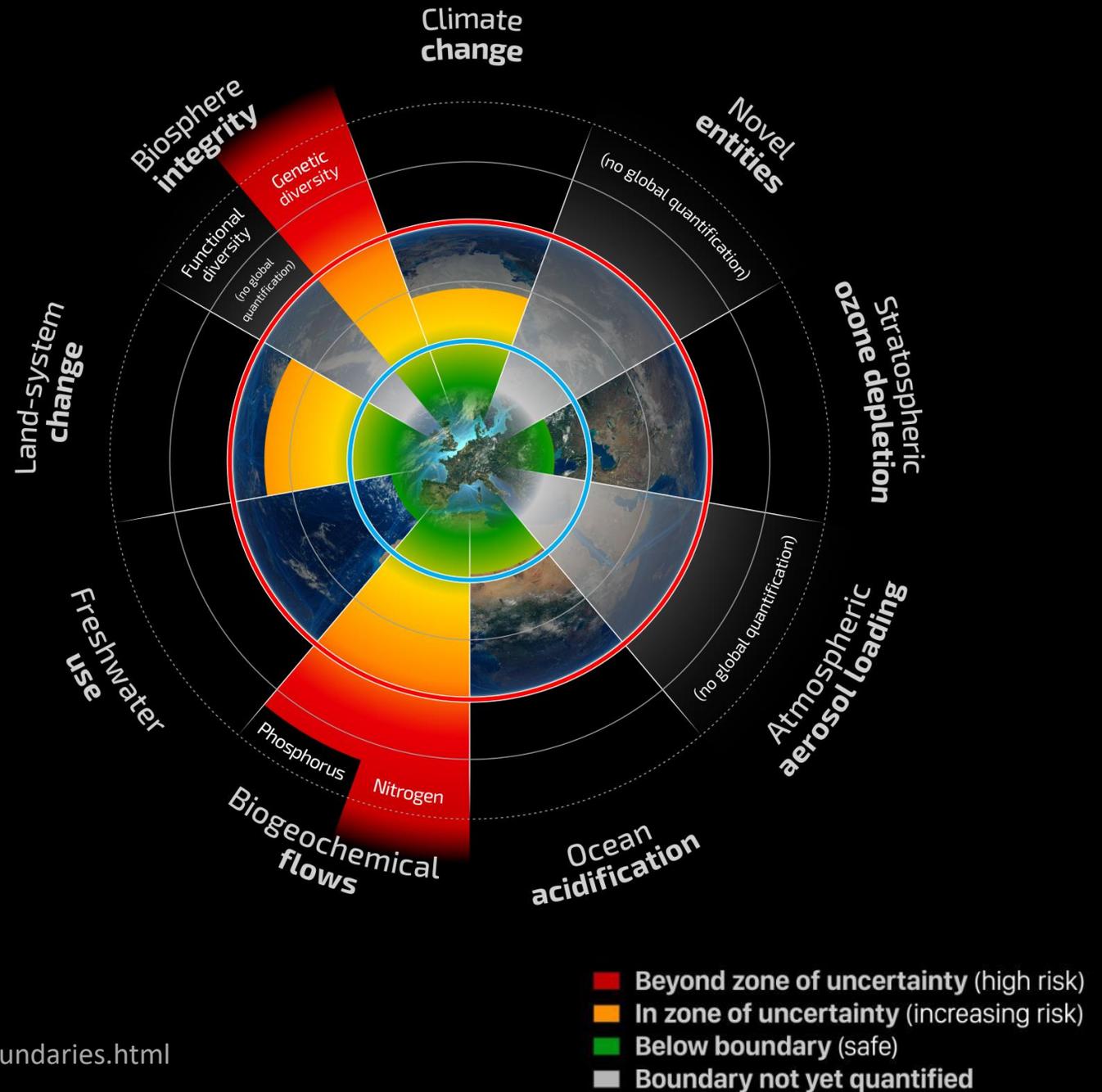
Source: Brookings

# Urbanization to 2050



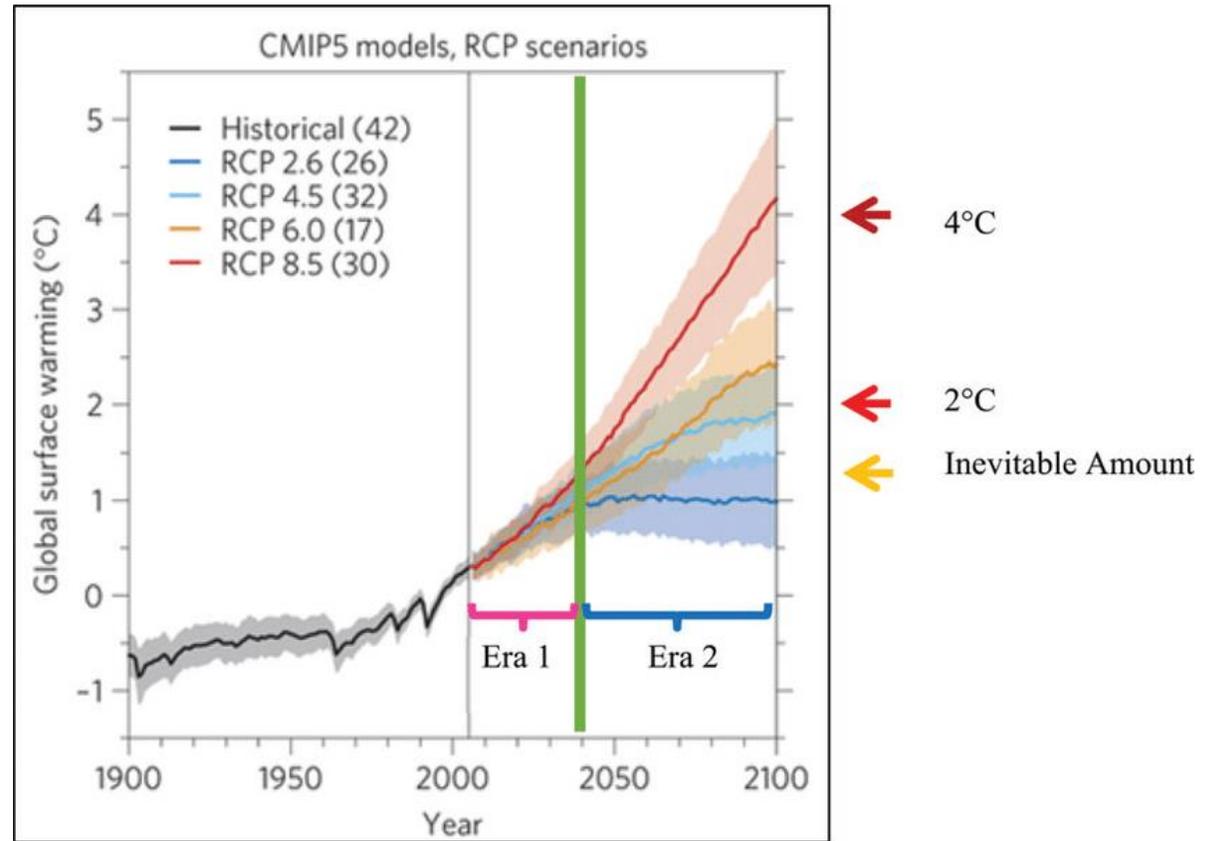
# Planetary Boundaries

- Quantitative boundaries within which humanity can continue to develop and thrive for generations to come.
- Crossing these boundaries can lead to large-scale abrupt or irreversible environmental changes.

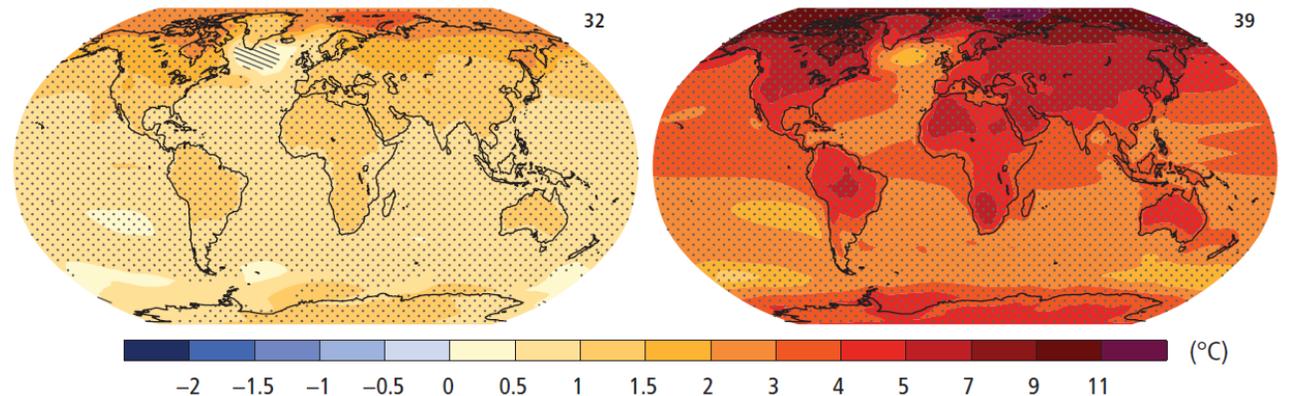


# Impending threat of climate change

- 2015-2018 were the four hottest years on record
- 20 of the warmest years occurring in the last 22 years



(a) Change in average surface temperature (1986–2005 to 2081–2100)





Projected deforestation 2010-2030

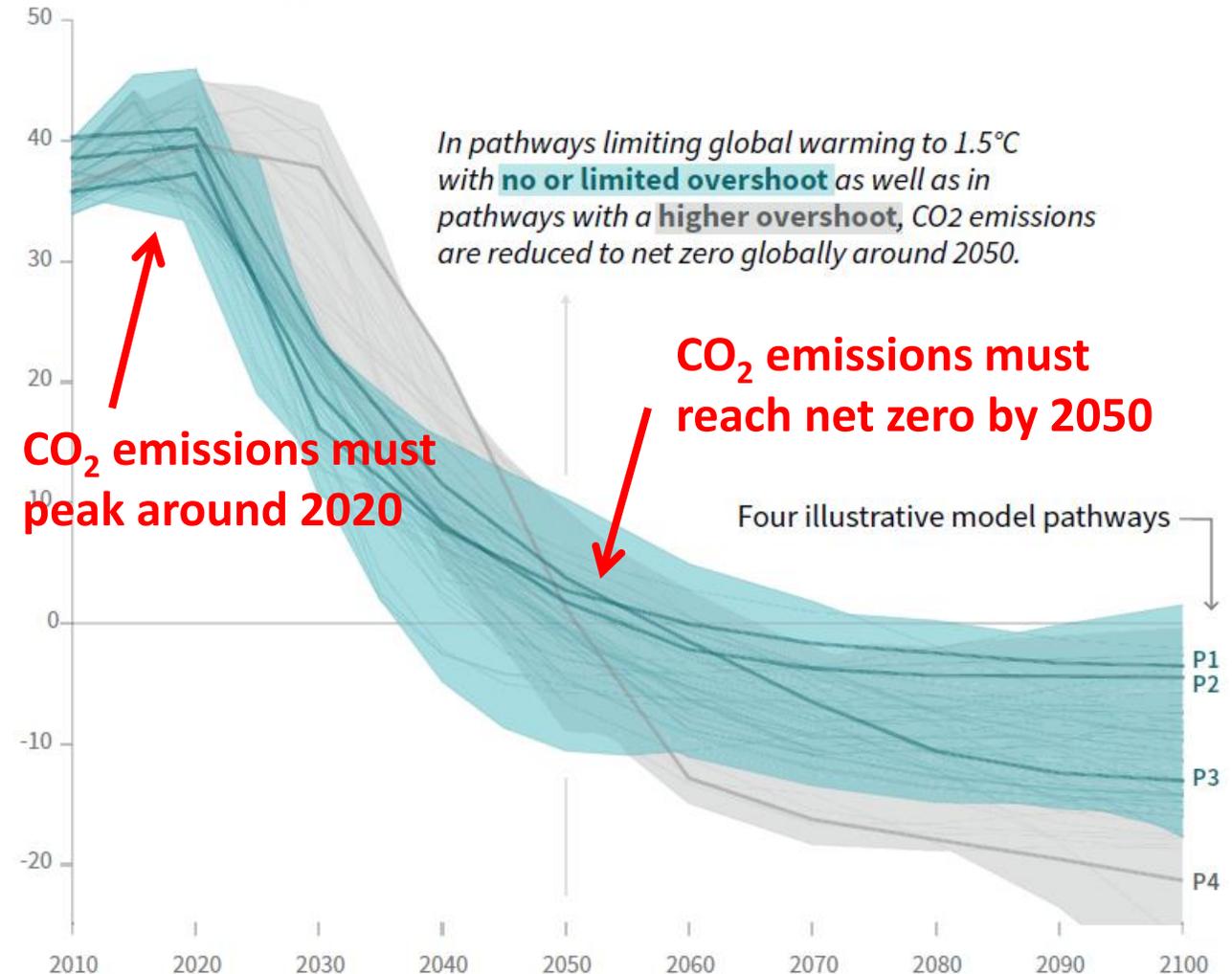
# Bending the emissions curve to zero



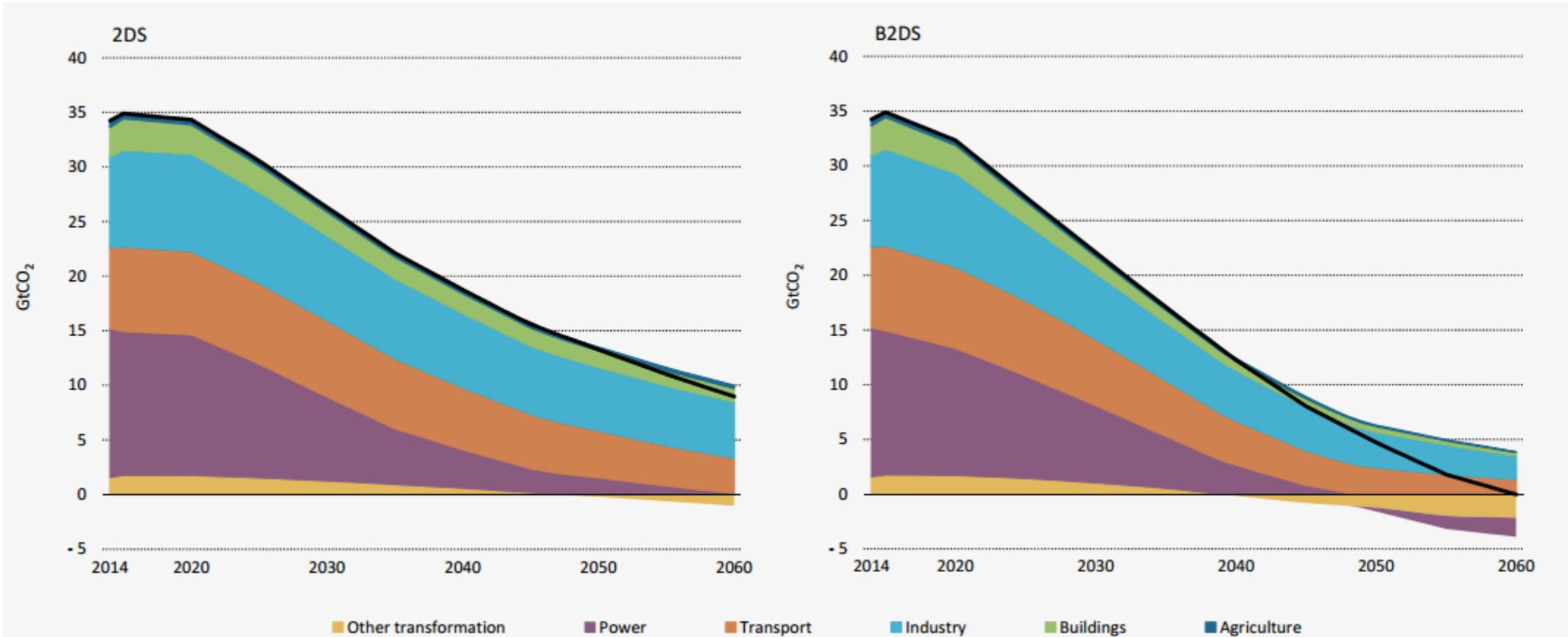
- The Paris Agreement is the world's best hope to combat climate change and limit global warming to less than 2.0°C
- **The IPCC 1.5°C report** indicates rapid and radical decarbonization is critical to limit global warming
- **All countries** need to achieve net zero emissions by 2050, and peak emissions by 2020

Global total net CO<sub>2</sub> emissions

Billion tonnes of CO<sub>2</sub>/yr



# Deep decarbonization wedges



Source: IEA



Global  
Green Growth  
Institute

# The case for green growth

# Transforming development pathways



## LOW-INCOME COUNTRIES

US\$1,035 or less GNI / capita  
36 countries  
~ 0.9 billion people

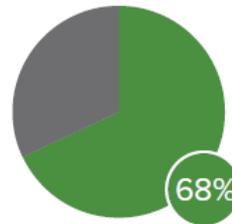
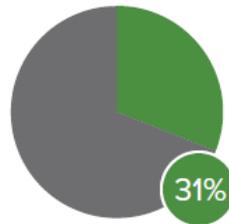
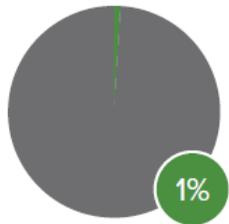
## MIDDLE-INCOME COUNTRIES

US\$1,035-12,616 GNI / capita  
103 countries  
~ 4.9 billion people

## HIGH-INCOME COUNTRIES

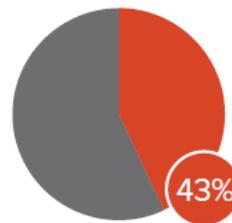
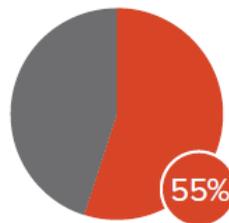
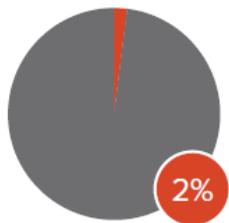
US\$12,616 or more GNI / capita  
74 countries  
~ 1.3 billion people

### SHARE OF WORLD GDP IN 2012



### SHARE OF WORLD GHG EMISSIONS IN 2010

EXCLUDING LUCF



- Maintaining **healthy and sustainable economic growth** is the top priority for governments worldwide.
- For **emerging economies, least developed economies and small island developing states**, achieving economic growth to **eradicate poverty and provide decent jobs** for the next generation remains the top priority.

# The economic case



**Economic growth is stronger** with sustainable infrastructure investment, rapid technological innovation, and increased resource productivity (NCE)



Taking climate action now, together with economic reforms, would result in **increasing growth benefits**—up to an additional 2.8% growth per year by 2050 (OECD)



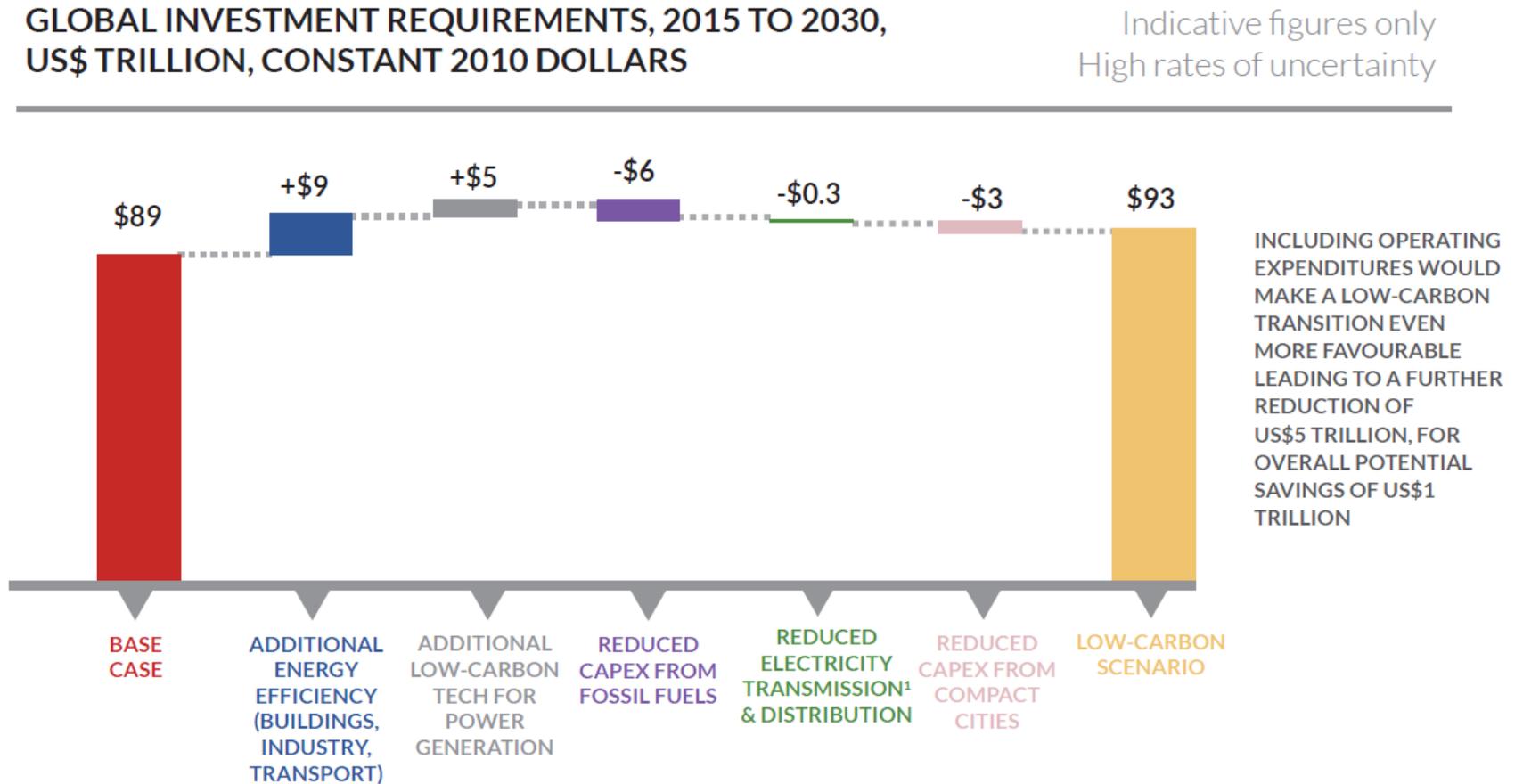
Investment in climate action could yield a global direct **economic benefit of \$26 trillion** and generate **65 million green jobs** (NCE)



Rapidly declining costs, technology innovation, finance, business action, and changes in policy and public opinion are spearheading **dramatic shifts towards renewables** (IRENA)

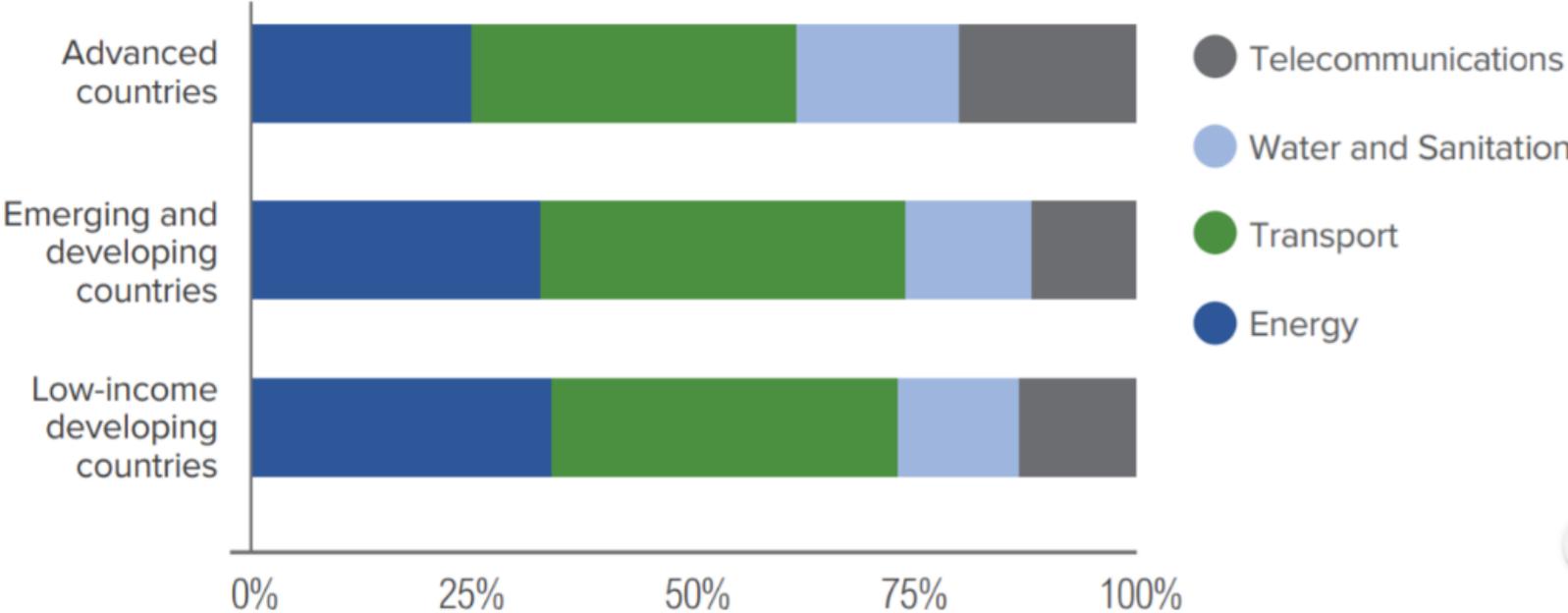
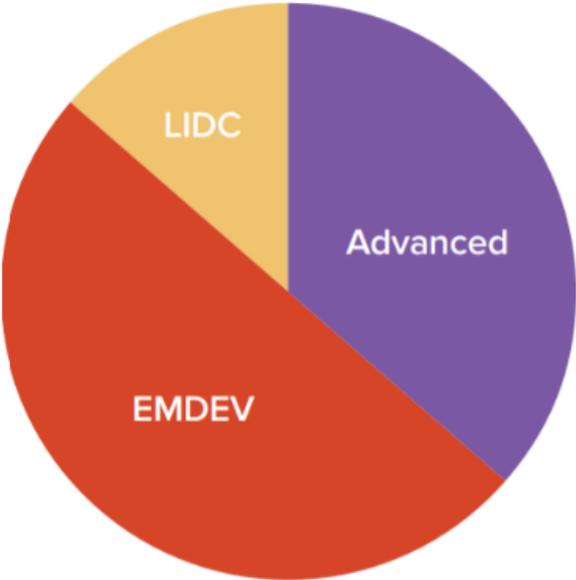
# Green transformation net benefits

Infrastructure capital spending can be 1% lower in a low-carbon scenario



Source: New Climate Economy, Better Growth, Better Climate, p212

# Cumulative Infrastructure investment needs by 2030



# Transformational opportunities



## Green disruptions:

- Solar PV and wind
- Energy storage
- E-mobility
- Self-driving cars
- Smart grids



## New business models to accelerate disruption



## Major policy shifts

- Targets of 100% renewables and electrified transport
- Ending fossil fuel subsidies
- Blocking coal development
- Reversing deforestation and unsustainable biomass use
- Unlocking climate finance and carbon tax/trading

# Huge and growing energy demand... ...increasingly met by renewables



Figure 1-4. Non-OECD energy consumption by region, 1990-2040

quadrillion Btu

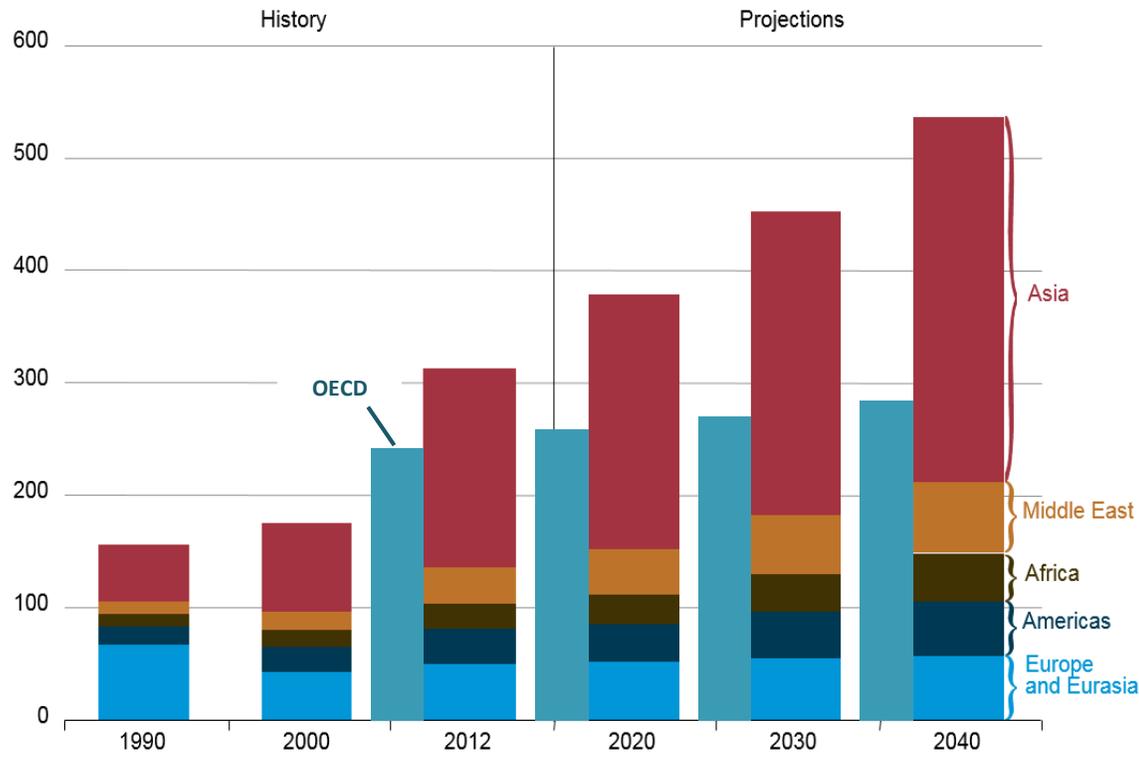
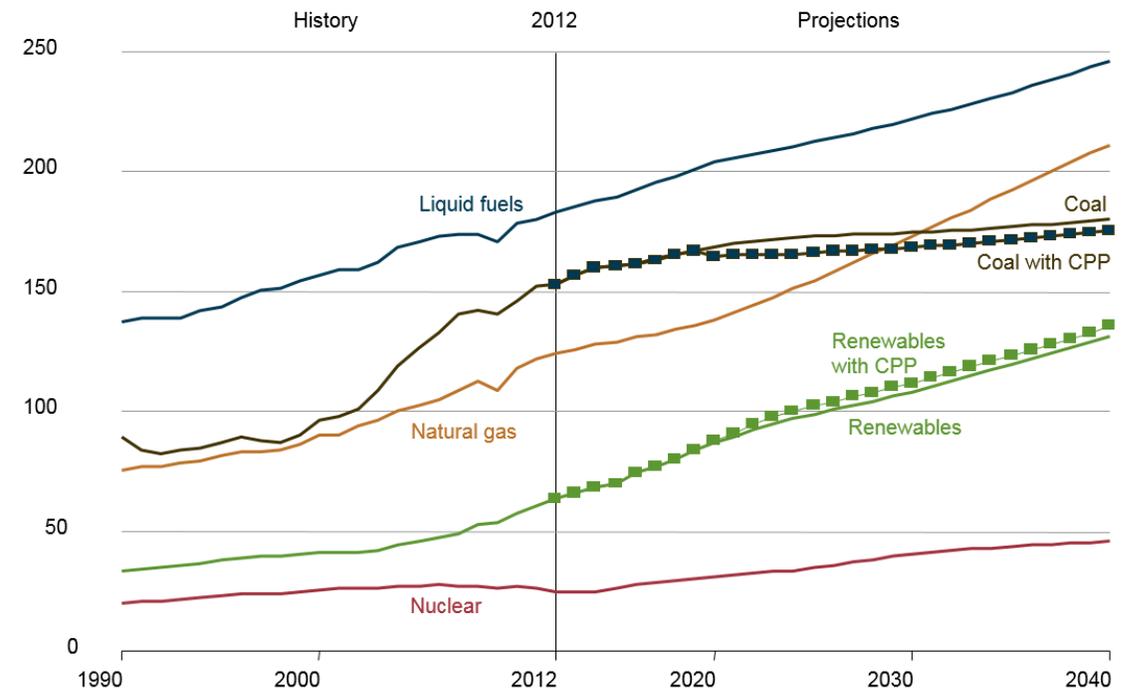


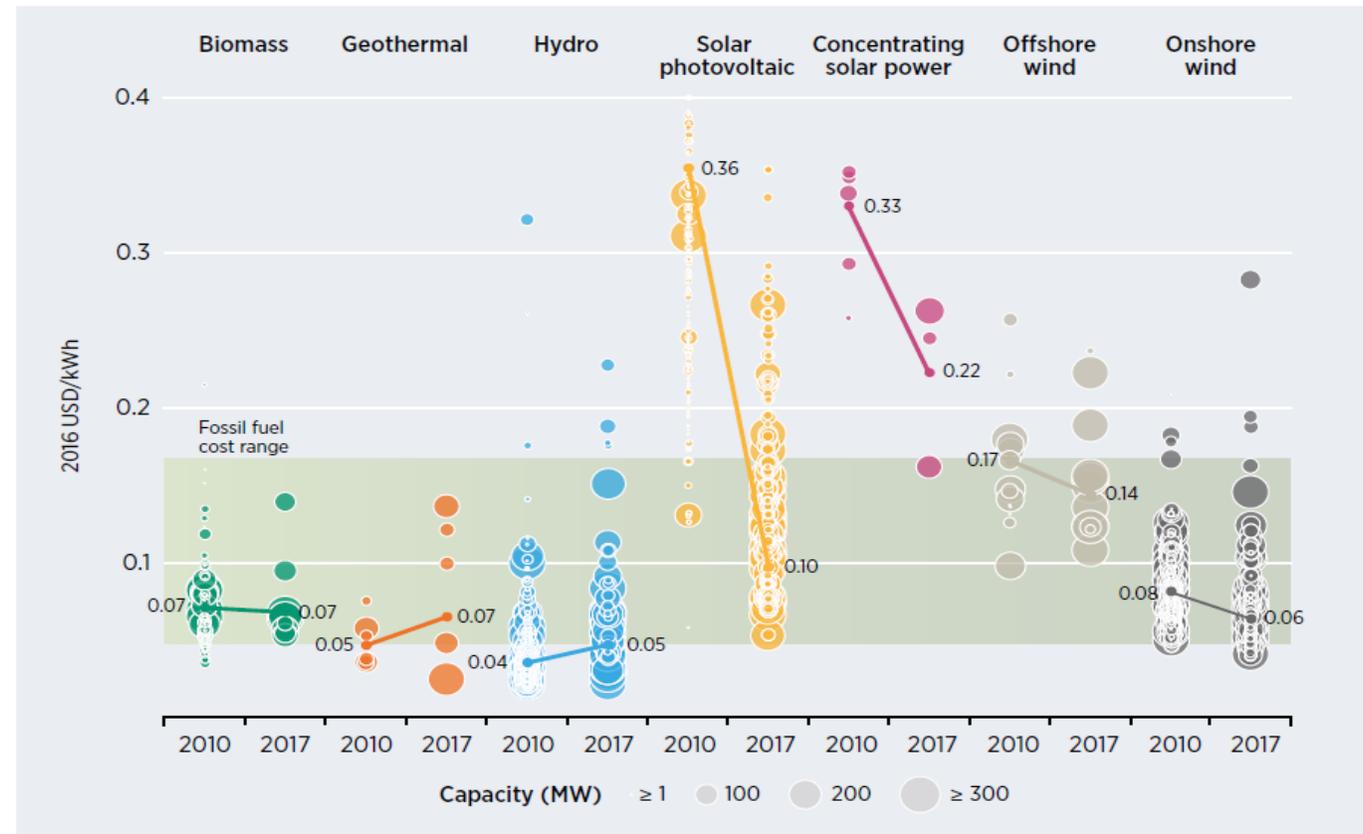
Figure ES-2. Total world energy consumption by energy source, 1990-2040

quadrillion Btu



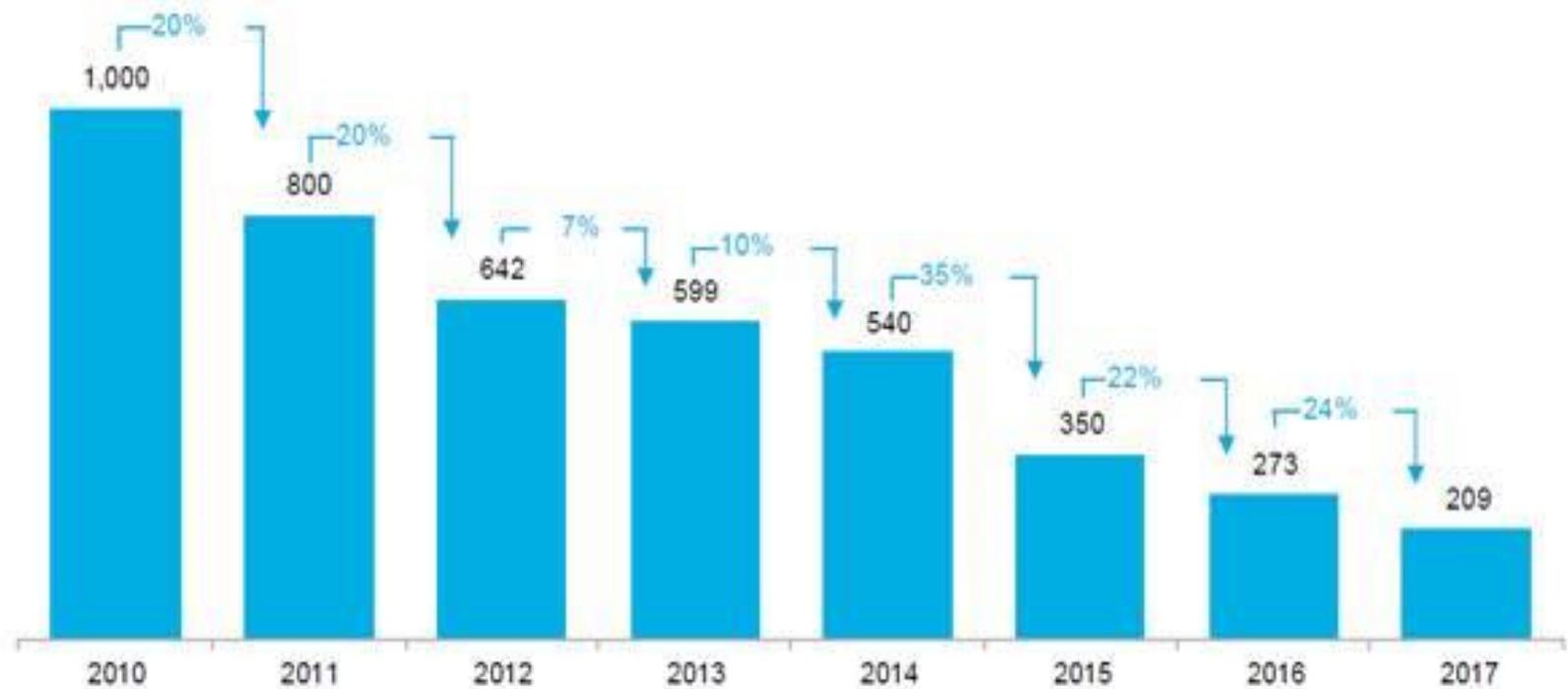
# Electricity

## Global energy cost from utility-scale renewable power generation technologies

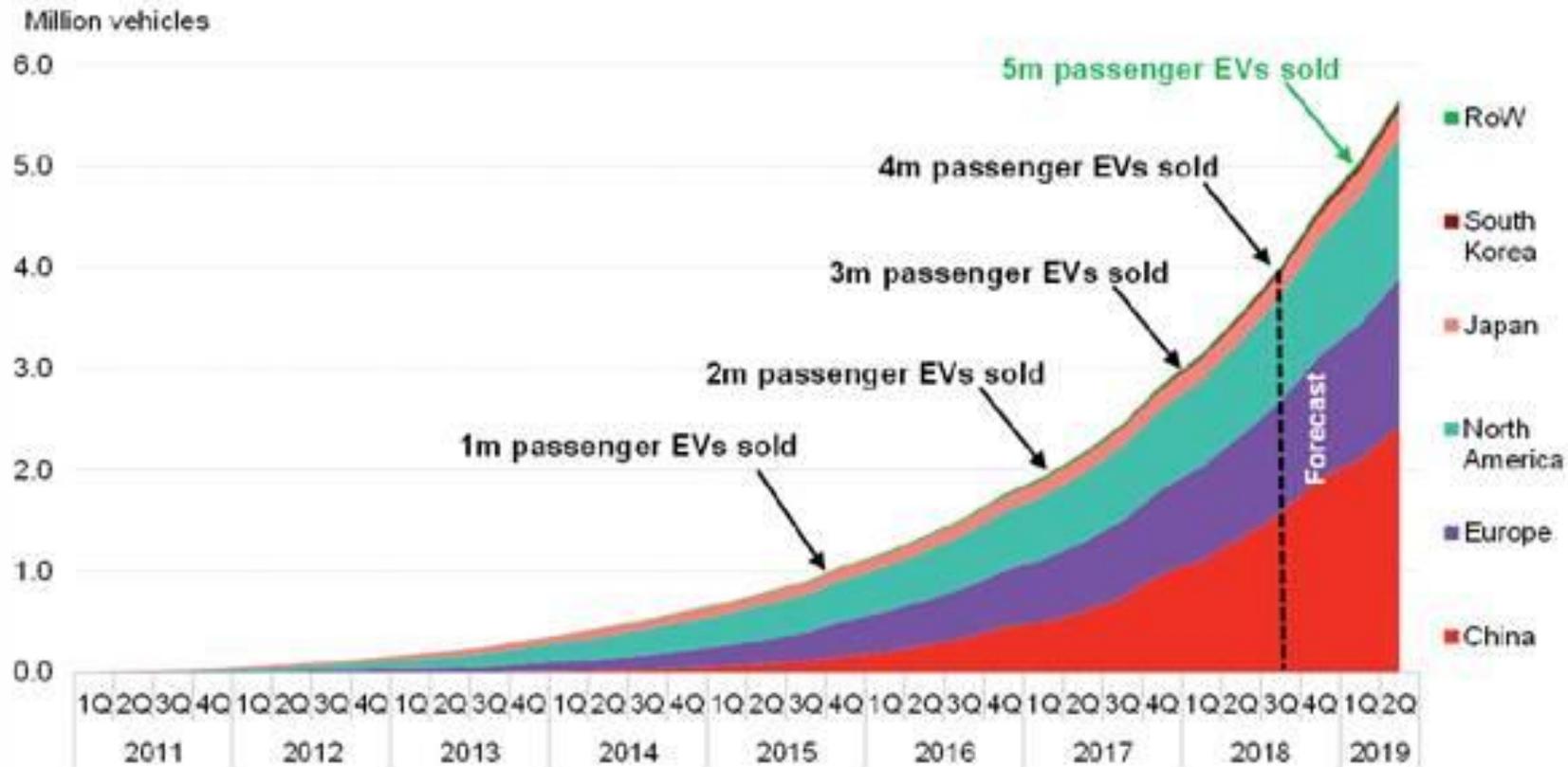


# Electricity

**Lithium-ion battery pack price (USD/kWh)**



# Electric vehicles





Global  
Green Growth  
Institute

# GGGI's approach

# GGGI's definition of green growth

Green growth is a development approach that seeks to deliver **economic growth that is both environmentally sustainable and socially inclusive**

GGGI seeks opportunities for economic growth that are:

- low-carbon and climate resilient
- prevent or remediate pollution
- maintain healthy and productive ecosystems
- create green jobs
- reduce poverty
- enhance social inclusion



# GGGI's delivery model is a systematic approach for Green Growth



## GGGI Value Chain



### Four primary thematic areas:



Sustainable Energy



Water & Sanitation



Sustainable Landscapes



Green Cities

### Cross-cutting issues:



Climate Change – NDCs, MRV, Diplomacy



Safeguards, Poverty Reduction, Social Inclusion

# UN 2030 Development Agenda and the Paris Climate Agreement



Governments now need to implement their **Nationally Determined Contributions (NDCs)** and are encouraged to adopt **long-term low emission development strategies (LEDS)**

Governments need to take action to meet their **Sustainable Development Goals (SDGs)**



# Unlocking progress through green growth



Green growth strategies and  
planning frameworks



Policy changes – energy,  
sustainable landscapes, water  
and sanitation, green cities



Financing and investment –  
mobilizing capital

# Green growth strategies and planning frameworks



Metrics & indicators

Green growth potential assessment  
Green growth performance measurement



Green growth strategic plan development (in line with national development plans)



NDC development – near-term plans with targets



LEDS development – long-term pathways



Measurement, Reporting, and Verification (MRV) systems



Capacity building & knowledge sharing

# Green growth planning frameworks – building blocks for green growth

---

- **Green growth offers the only development path that can provide economic growth that is sustainable and inclusive in the 21st century**
- Green growth strategies provide the means to pursue a country's **national development agenda** with a strong local context and to pursue implementation of the **Paris Climate Agreement, the UN Sustainable Development Goals, and the Sendai Framework for Disaster Risk Reduction**
- Accelerated transition to a green and circular economy requires a **serious re-direction of public policy, public finance and private investments** in all countries, developed and developing
- Investments in sustainable infrastructure, renewable energy, sustainable transport, green cities, and sustainable landscapes can present **commercially attractive investment opportunities**

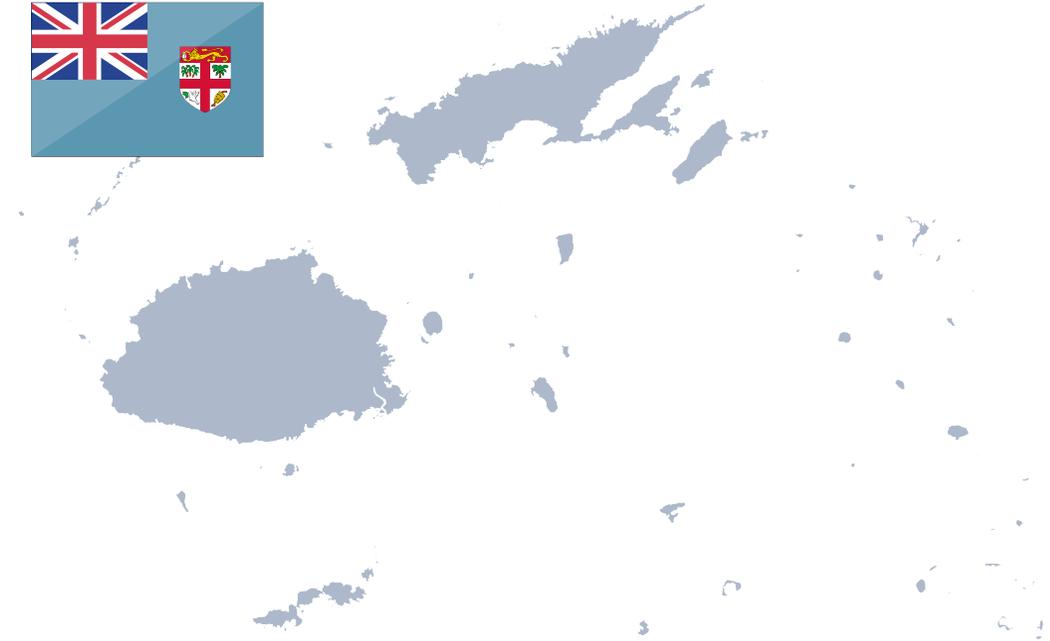


Global  
Green Growth  
Institute

# Country Progress

# Green initiatives in Fiji

- **National Green Growth Strategy adopted in 2015**
- **Fiji's NDC Roadmap** for the energy sector launched in 2017
- **Feasibility studies** for 100% renewable energy projects for Taveuni and Ovalau - US\$3.5M investment commitment
- **Green City initiatives**
  - Low-sulfur Fuel Standard Euro-4, adopted by Cabinet, initiating low emissions public transportation work
  - Urban waste management option assessment
  - Roof-top solar for social housing
- **Fiji Low Emissions Development Strategy (LEDS)** for all sectors launched in 2018
- **Young entrepreneurs** green business capacity building



# Fiji LEDES: inclusive, government-led process

- **Ministry of Economy chaired national LEDES Steering Committee** – 14 Ministries and other bodies
- **GGGI supported** design, stakeholder process, scenario development, compilation of the LEDES
- **Series of stakeholder consultations**
- **Full policy alignment** with National Development Plan, Green Growth Strategy, Adaptation Plan, and NDC Implementation Roadmap
- Identified **implementation projects and financing needs**



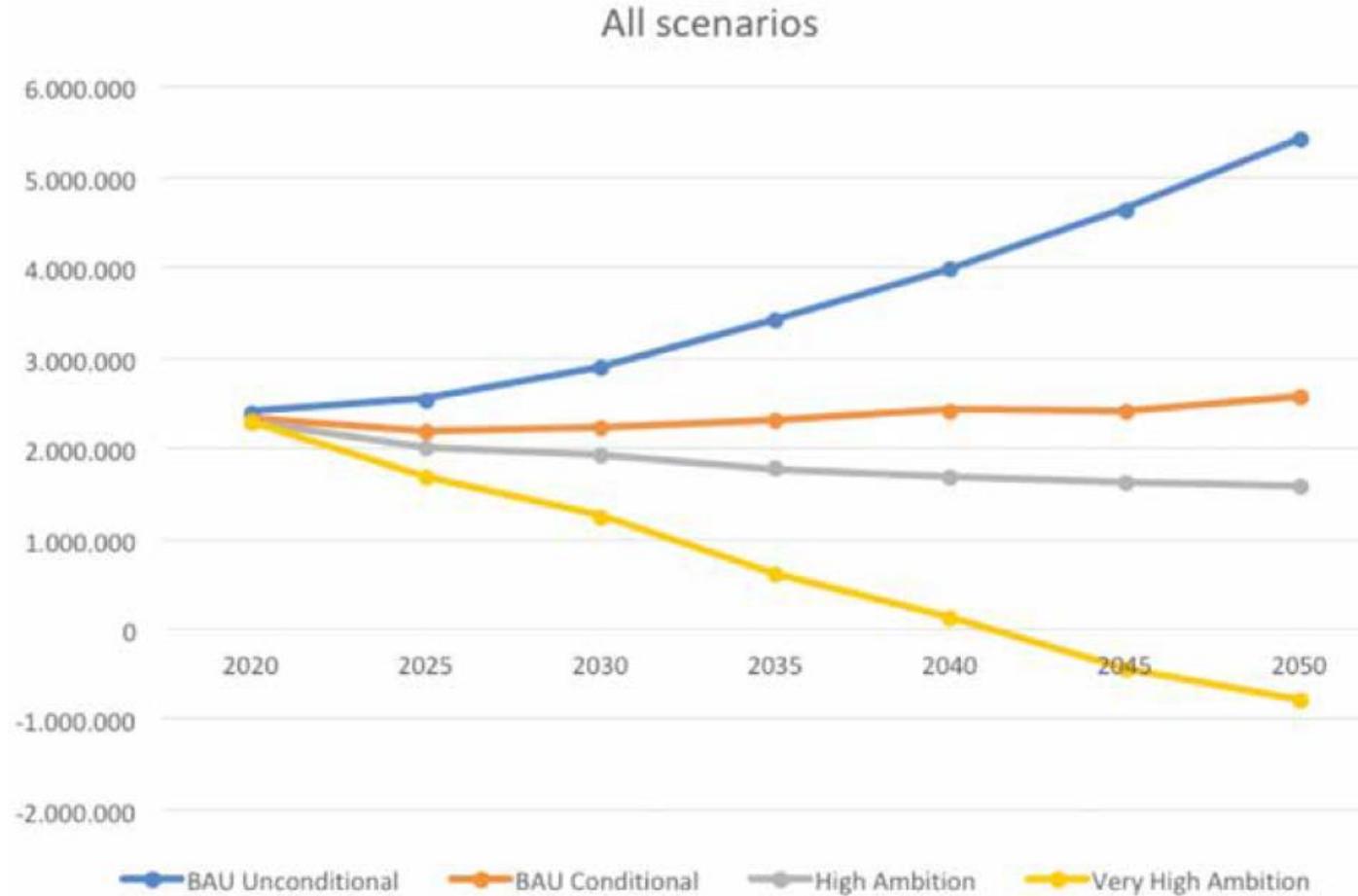


## Economy-wide LEDS

- **Electricity and Other Energy Generation and Use (Energy)** – towards 100% renewable
- **Land Transport (Energy)** – towards 100% electric
- **Maritime Transport (Energy)** – towards 100% electric/zero-emission
- **Domestic Air Transport (Energy)** – range of mitigation measures
- **AFOLU** – towards ending deforestation, promoting afforestation and reforestation
- **Coastal Wetlands (Blue Carbon)\*** - promoting restoration and recovery
- **Waste Sector** – range of mitigation measures
- **Links/synergies** with adaptation and social, economic, and environmental considerations explored, capacity building needed, and governance and M&E

*\* not included in total emission reductions due to lack of data*

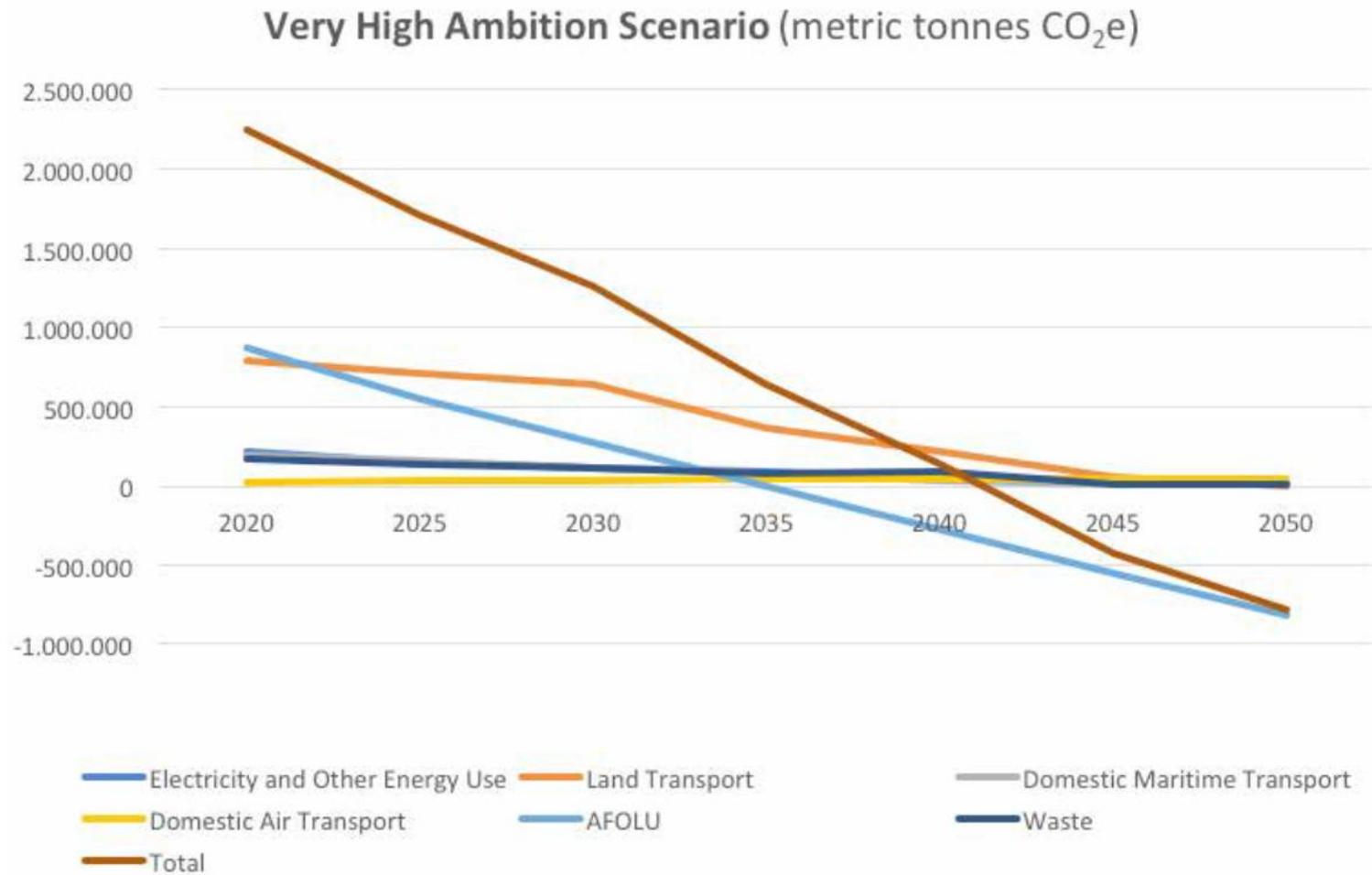
Figure 1. Total Net Emissions for Fiji under the four LEDS scenarios  
 (all values in metric tonnes CO<sub>2</sub>e).



LEDS  
 Scenarios –  
 total for all  
 sectors

Scenario	2020	2025	2030	2035	2040	2045	2050
BAU Unconditional	2,344,868	2,511,395	2,812,491	3,204,777	3,602,674	4,047,357	4,544,058
BAU Conditional	2,279,948	2,200,437	2,232,885	2,259,745	2,300,641	2,286,008	2,363,344
High Ambition	2,259,578	2,032,107	1,897,665	1,732,042	1,592,815	1,499,357	1,399,040
Very High Ambition	2,250,564	1,712,595	1,264,809	637,601	136,430	-422,128	-782,767

# Fiji Very High Ambition Scenario





## Ethiopia's Climate Resilient Green Economy (CRGE) strategy

- Developed and adopted in 2011 with GGGI's support
- One of the notable examples of how a least developed country could pursue long-term economic growth and development through climate action
- Describes mitigation and adaptation measures that provided the building blocks for its INDC
- Measures outlined in the CRGE strategy result in a practical target of 64% greenhouse gas reductions by 2030 compared with a business-as-usual while aiming to achieve the status of a middle-income country by 2030

# Ethiopia's INDC

- First LDC to submit its INDC to the UNFCCC Secretariat
- INDC describes plans to reduce total emissions by 64% below BAU by 2030
- Aim of nationwide power supply by 2025
- Energy-related emissions reductions will be achieved by expanding electricity generation with renewable energy and promoting energy-efficient technologies in transport, industry, and buildings
- Before formulation of the NDC, Ethiopia revised its national energy policy to align it with the CRGE



# Recent achievements under CRGE

- In 2017, USD 397 million green investment mobilized for CRGE, including USD 337 million from the international private sector for a water project
- Financial analysis prepared to improve understanding of existing financial gaps and requirements for CRGE implementation
- GCF approved USD 45m in funding to enhance critical irrigation systems in drought stricken regions.
- Efforts to develop a Climate Finance Expenditure Tracking System and to develop an MRV system

# Ethiopia

## Designing of Sustainable Crop Aggregators



### Context/Challenges

- Ethiopian agricultural sector lacks robust linkages between agricultural suppliers, input providers, financiers and purchasers.

### Aggregated Demand

For buyers to reduce transaction costs, engaging numerous individual and dispersed smallholder farmers



### Aggregated Supply

Farmers to provide direct access to processing storage, large-scale purchasers



**Terms of Purchase**

- Against entry into silo/warehouse/other
- Against bill of lading
- On presentation of voucher (for fertilizer or seeds)

### Solution

- Designing a “crop aggregator” introduces an intermediary actor – such as a specialized agency of the Government of the Federal Democratic Republic of Ethiopia - in the value chain between the supplier and purchaser.
- Making linkages between farmers and the private sector that support the adoption of technologies and sustainable best practices leading to the production of “significant marketable surpluses.

### Interventions

- Identifying locations for aggregation centres
- Ensuring compliance with the Ethiopia
- Commodity Exchange
- Attracting suppliers
- Inviting buyers
- Informing logistics providers
- Inviting financiers





# United Arab Emirates (UAE)

- UAE is an example of utilizing revenues from hydrocarbons to successfully develop and diversify its economy.
- In 2012, UAE launched its **National Green Growth Strategy** under the Prime Minister's Office with the aim to maintain long-term economic growth and become a leader in export and re-export of green products and technologies
- GGGI supported UAE in developing the National Green Growth Strategy that served as the foundation for its first INDC submitted to the UNFCCC.
- UAE government is implementing **Green Agenda 2030**, a national cross-sector green growth framework, to achieve its desired objectives of improved environmental performance, climate resilience, economic diversification and enhanced monitoring capabilities
- UAE's **Climate Change Action Plan 2017-2050**, developed in partnership with GGGI, outlines three key climate priorities:
  - national GHG emissions management system
  - national adaptation planning and implementation
  - private sector driver innovative economic diversification programs.



## Promoting green growth in Indonesia's provinces

- Strengthening planning and investment decision-making in East Kalimantan through the design and delivery of extended Cost-Benefit Analysis (eCBA) and Green Growth Potential Analysis (GGPA) tools and workshops.
- Developed pre-feasibility studies to government stakeholders and private investors.
- Supported in the acceleration of investment in inclusive, green projects, with an aim for Indonesia to meet its NDC targets and SDGs
- Unlock large-scale finance and deliver high impact with a focus on developing climate-smart and socially inclusive investment projects.
- Provincial-level engagement influencing many of the policies that are under development in all 3 focus sectors, namely energy, special economic zones (SEZ) and forests/land use.
- Development of Provincial Energy Plans (RUED) in both East and Central Kalimantan



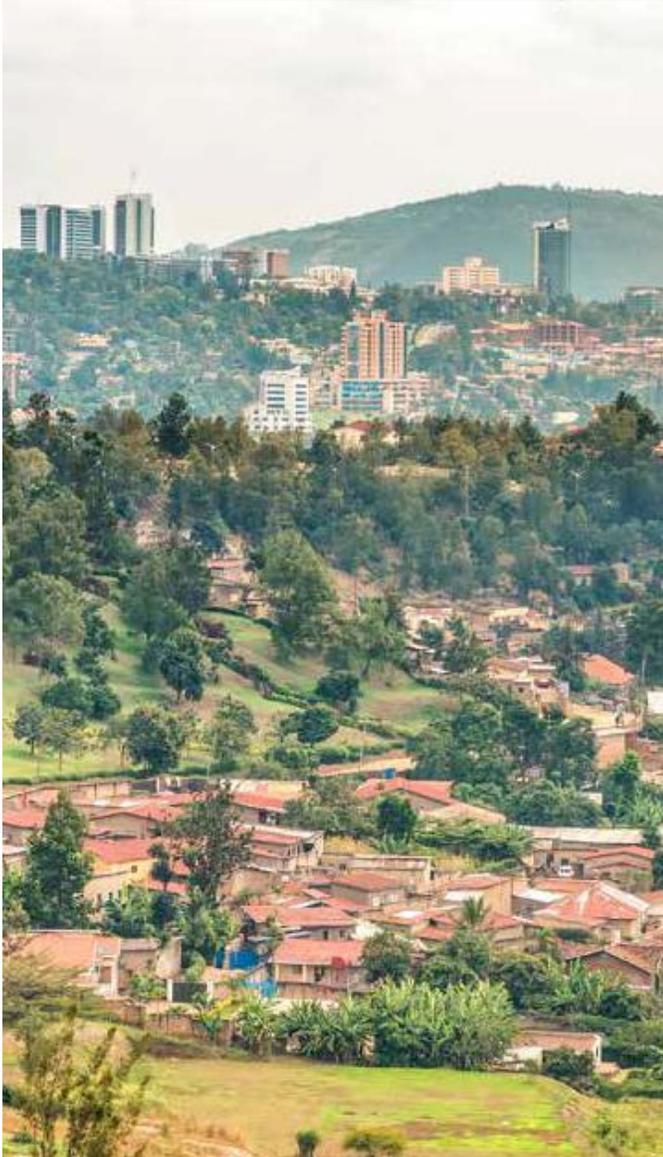
## Promoting solar batteries at Indonesia's provincial level

- In Nusa Tenggara Timur province, GGGI conducted a **pre-feasibility** for the development of solar energy plus batteries for eight small islands
- **Aggregation of the eight small islands** raised the scale to 15 MW so private investors could make an investment without requiring concessional finance



# Rwanda – promoting green planning and finance

- Development of the **Environment and Natural Resources Sector Strategic Plan (ENR SSP)** as a critical input to strengthening and mainstreaming of green growth and climate resilience.
- **Accessing financing** to support the transition to an environmentally sustainable, low carbon and climate resilient economy that contributes to wealth creation and poverty reduction.
- Since its inception, **FONERWA** has created more than 130,000 green jobs, provided more than 55,000 off-grid households access to clean energy, and supported more than 100,000 people to cope with effects of climate change in rural Rwanda
- FONERWA has increased the fund's commitment rate over the last 5 years to USD 10m per year, which it expects to maintain over the next 5 years with some increased investment in infrastructure
- Ministry of Environment became the first Ministry to be **accredited by the GCF**, access the Project Preparation Facility for USD 1.5 million, and access the GCF's Readiness Project for USD 300,000



# Rwanda – promoting green cities

- Rapidly urbanizing country (4.5% per year growth)
- National Roadmap for Developing Green Secondary Cities adopted in 2016, followed by project financing
- Green urbanization implementation through integrated planning, financing of pilot projects, and institutional strengthening
- The Prioritized Actions identified in the National Roadmap for Green Secondary Cities were implemented in 6 secondary cities
- Funding was identified for the Rubavu Eco-Tourism project from Fonerwa. Funding was also identified for the WASAC Faecal treatment Sludge Treatment Plant treatment projects from the African Development Bank



## Rwanda green buildings

- The **Rwanda** Ministry of Infrastructure in collaboration with multiple stakeholders recently established the Green Building Minimum Compliance System
- The System is a point-based rating system of green building compliance that aims at supporting building owners, and developers select and measure green building indicators based on the applicability to the building type, its location, usage and benefits associated.



# Colombia – long-term green growth planning



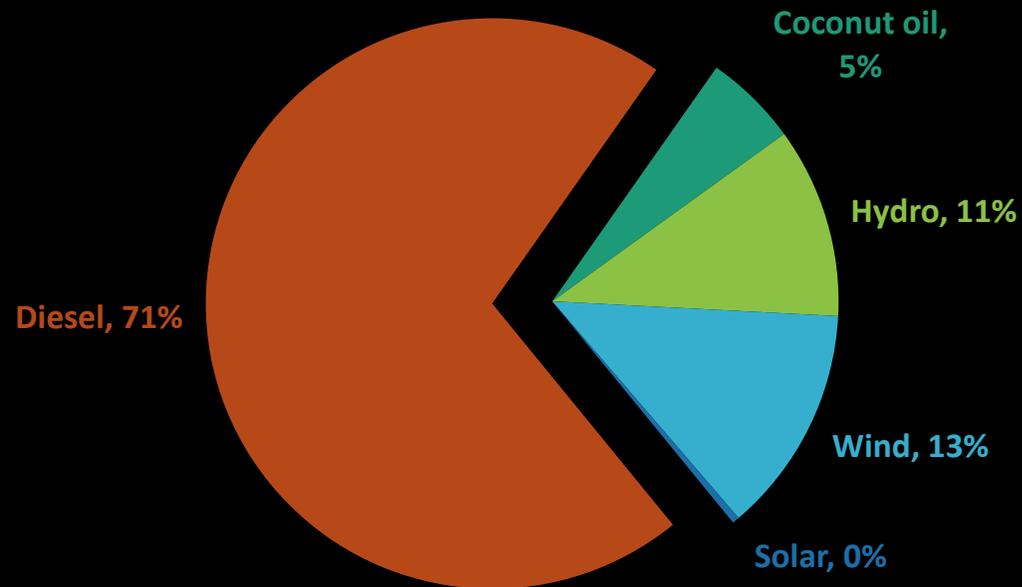
- Adopted **Long-Term Green Growth Policy** in 2018 in accordance with the National Development Plan 2014-2018 - new sources of growth, innovation, job creation, and income generation – enables Colombia to meet SDGs and NDC targets by 2030
- **2030 Green Growth Roadmap** to advance a new economic growth model based on improved competitiveness, social inclusion and the efficient use and protection of Colombia's natural capital
- Nationwide **REDD+ payment for performance mechanism** with a total of USD 15 million in funding to the Government of Colombia
- Taking steps to ensure that **reduced deforestation targets** are met
- **Green growth target** setting to be reflected in the next Development Plan
- **Investment-ready project/investment proposals** submitted under Sustainable Colombia Initiative and for Amazon Vision, taking into account social inclusion and gender issues

# Vanuatu: Off-grid energy production with battery storage



Vanuatu's national financing vehicle to increase rural energy access from 10% to 60% by 2020, and to 100% by 2030

2016 VANUATU ENERGY MIX



# Indonesia Solar PV Project in NTT Province – Island Solution

## Current Gap

Most of the installed power plants operating in NTT are diesel fueled and hence the cost of electricity is high, power generation is polluting and supply not self-sufficient.

## Project Overview

- GGGI is working in 8 locations in NTT to bundle small scale solar PV grid connected projects.
- Implementing the project will help PT PLN meet its solar PV target for the NTT province.
- Investment size: US\$15 million

## Project Status & Next Steps

- Pre-feasibility assessment has been completed. The document was shared with the NTT government. Governor approved the assessment.
- Letter of Intent between investor and governor (November 2017).
  - ✓ Engie + Developer
  - ✓ NVV + Private equity

## Impact

- Size of the impact: The PT PLN RUPTL (planning document) targets 15MW of solar PV, this project will help meet at least 15% of that target.
- Nature of the impact: 32% of households in NTT do not have electricity; this solar PV bundle of projects will contribute to PT PLN's RUPTL to provide clean electricity to the NTT population



# Vietnam Biomass to Energy Project

## Potential to leverage up to \$60M in private capital



### Current Gap

There are 41 sugar factories in Vietnam that produce about 7.8 million tons of waste bagasse per year that is not being utilized economically.

### Project Overview

- Pre-feasibilities for currently inefficient selected Vietnam sugar mills to retrofit them with efficient biomass utilization for combined heat and power (CHP) generating up to 45MW, partly to feed to the Vietnam grid, to reduce costs and enhanced revenues.
  - Lam Son Sugar Factory
  - Vi Thanh Sugar Factory
- Investment size: US\$ 50-60M

### Impact

- Potentially increasing the number of sugar mills that feed electricity to the grid by 29%, increasing renewable energy within Vietnam, in line with gov't targets for biomass power production.

### Project Status & Next Steps

- Pre-feasibility for two sugar mills are finalized (Lam Son Sugar Factory & Vi Thanh Sugar Factory)
- Next step: Investor workshop on Pre-feasibility reports (early October)



# Thank You

---

**Orestes Anastasia**

Office of Thought Leadership  
Global Green Growth Institute  
Seoul, Republic of Korea  
orestes.anastasia@gggi.org



[www.gggi.org](http://www.gggi.org)



Follow our Activities on  
Facebook and Twitter