

Climate Change Mitigation and Adaptation with a focus on the Water and Energy Sectors

Lisbon, 30 September 2020

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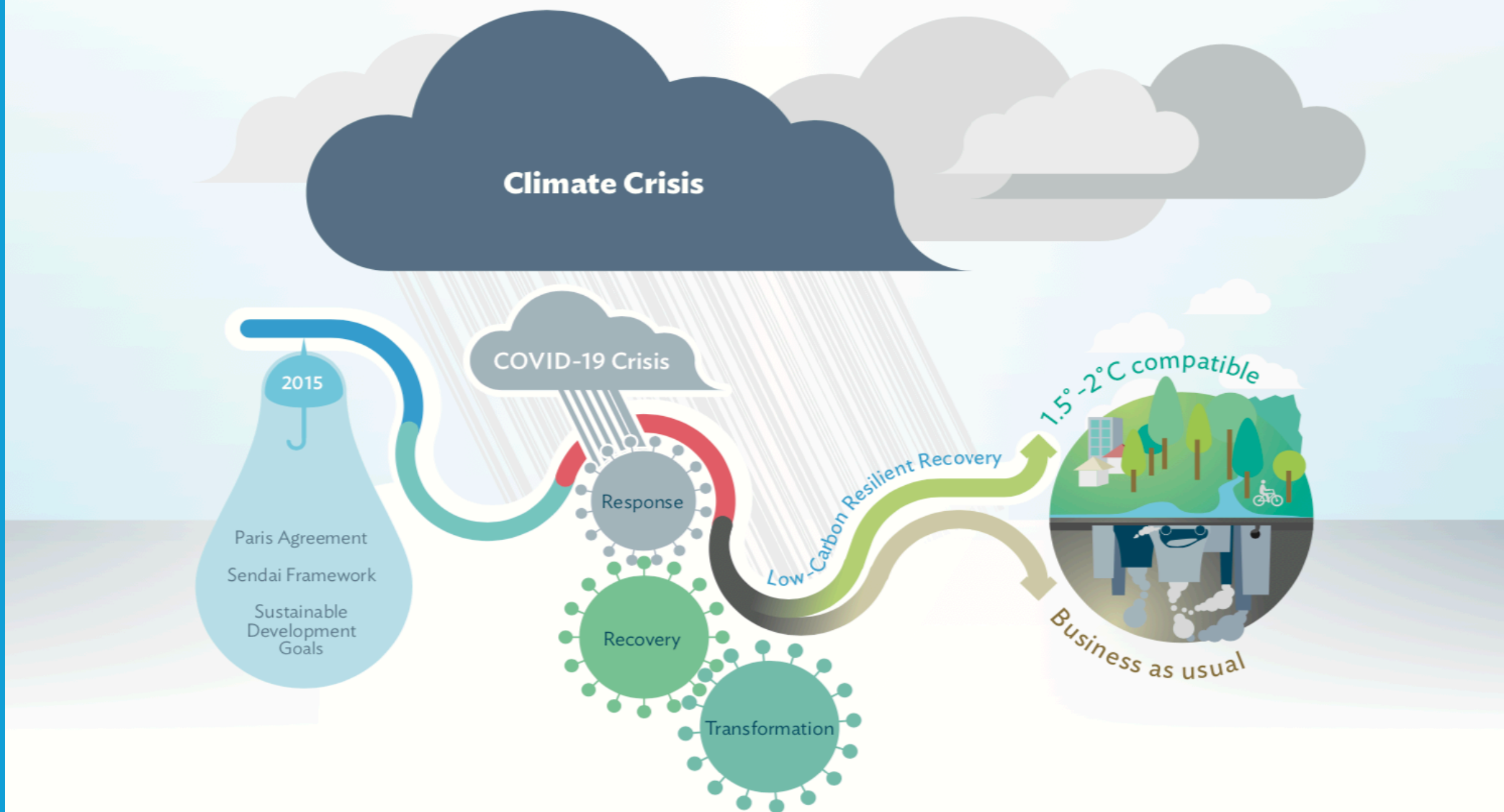
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COVID-19 RECOVERY

A Pathway to a Low-Carbon and Resilient Future



- Changes in climate will drive local and global risks – and these risks include pandemics like Covid-19.
 - We must think about the changing economics of the post-Covid 19 world. Will this time be different (e.g. the 2008 financial crisis and response)?
 - We need to integrate risks and opportunities in a context where social norms are challenged, companies are challenged, and virtual dialogues (like today's) take center stage.
- The economics of a post-Covid 19 world will require 1) a transformation of supply chains and 2) a massive reallocation of capital.
 - The world is at a turning point: opportunity to 1) push the climate agenda 2) do away with the jobs and infrastructure of yesterday by reducing further the dependence on fossil fuels.
 - The decisions taken in the coming months will have consequences for several generations to come, especially on vulnerable communities.
- Need to invest in energy efficient buildings, storage, transmission and distribution, climate resilient infrastructure, water management.
 - Need to de-risk these investments to make them bankable.

OUTLINE

Asia-Pacific Climate Change and Disaster Risk Management (DRM) Challenge

Priorities of ADB on Climate Change and Disaster Risk Management

Climate and DRM Finance

Innovative Projects and Initiatives

ADB Energy and Water Sector Operations

ADB

ADB

Asia-Pacific Climate Change and Disaster Risk Management Challenges



Climate Change and DRM Challenges

ASIA AND THE PACIFIC IS KEY

2017 CO₂ emissions:

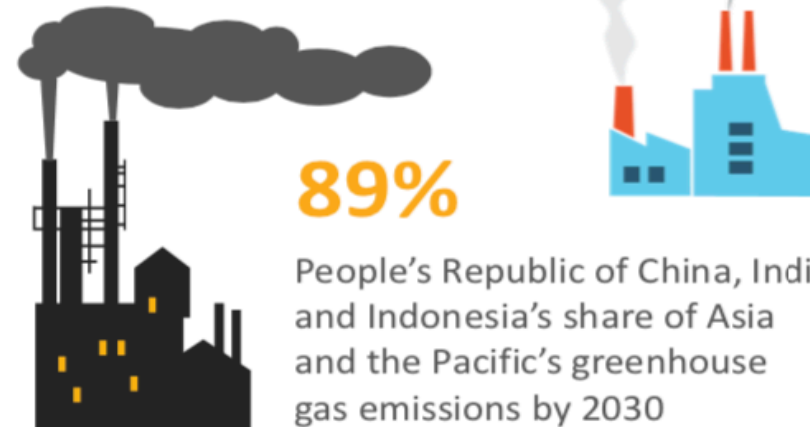


43%

Asia and the Pacific

57%

Rest of the world



89%

People's Republic of China, India, and Indonesia's share of Asia and the Pacific's greenhouse gas emissions by 2030

Developing Asia's share of world electricity demand will grow to*

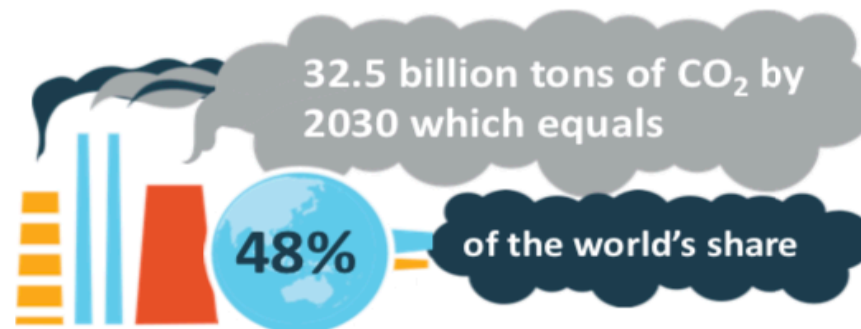


**43%
in 2030**

The PRC and India will make up
64%
of Asia's power consumption

*projection under New Policies scenario

Without radical changes, Asia and the Pacific will emit



32.5 billion tons of CO₂ by 2030 which equals

48%

of the world's share

Impacts from Disasters in Asia and the Pacific (1989–2018)



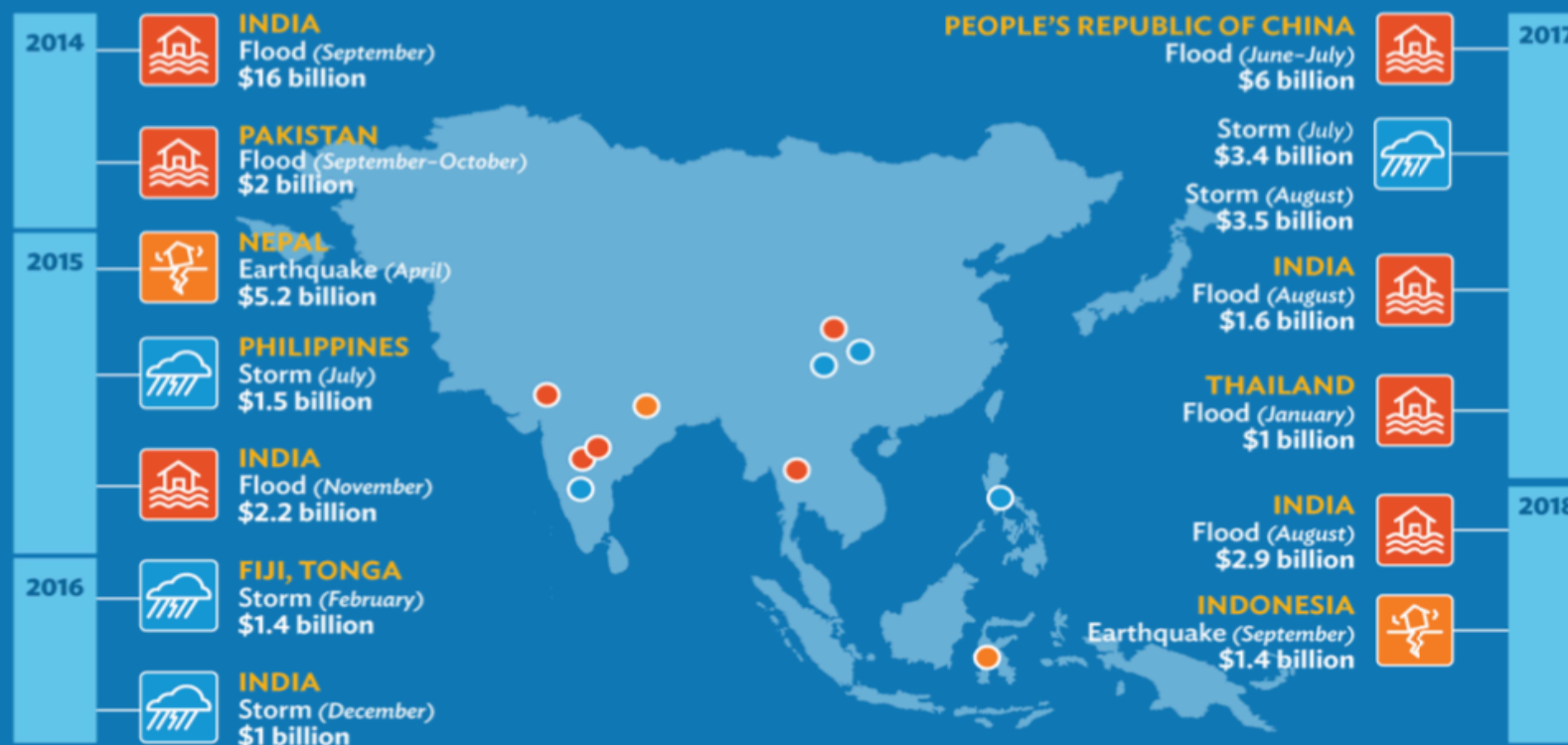
5.2 billion
People affected
by disasters



1 million
Disaster fatalities

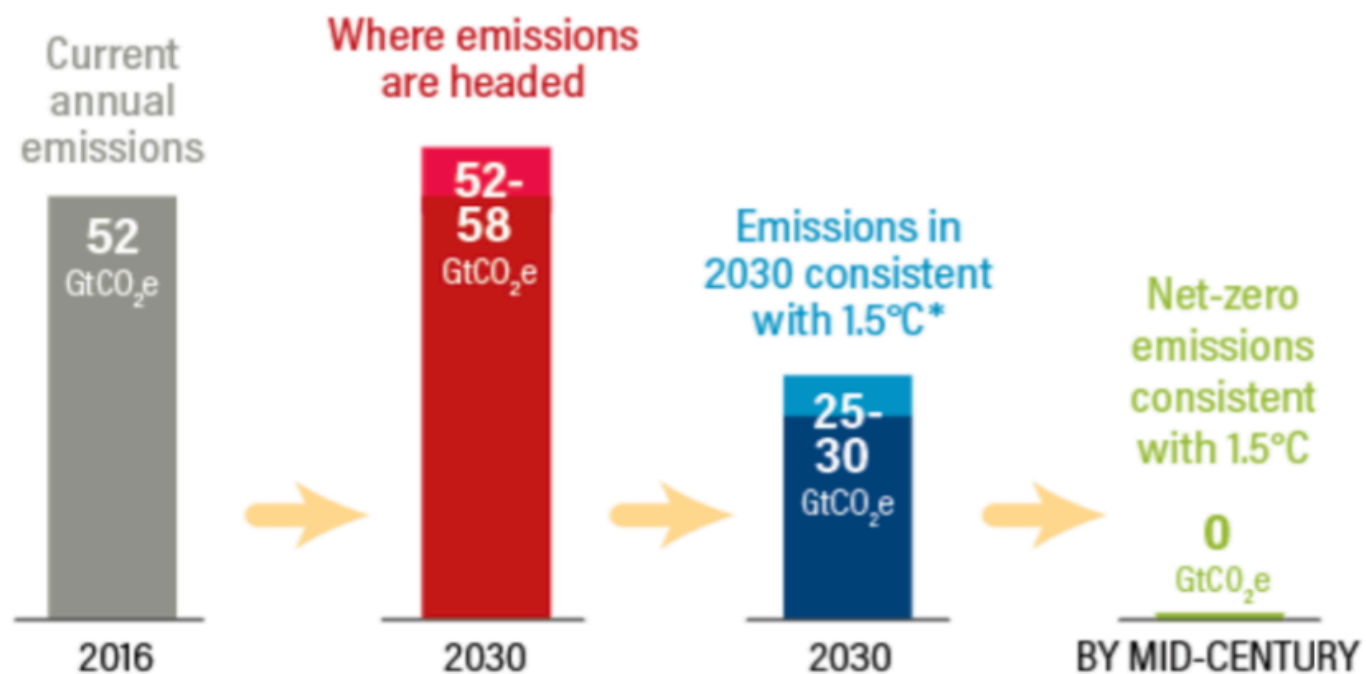


843.6 billion
Total direct physical loss

Damages from Recent Disasters in Asia and the Pacific¹

Note: 1. The amounts refer to the monetary amount of damage to property, crops and livestock at the year of the event. (Center for Research on the Epidemiology of Disasters)

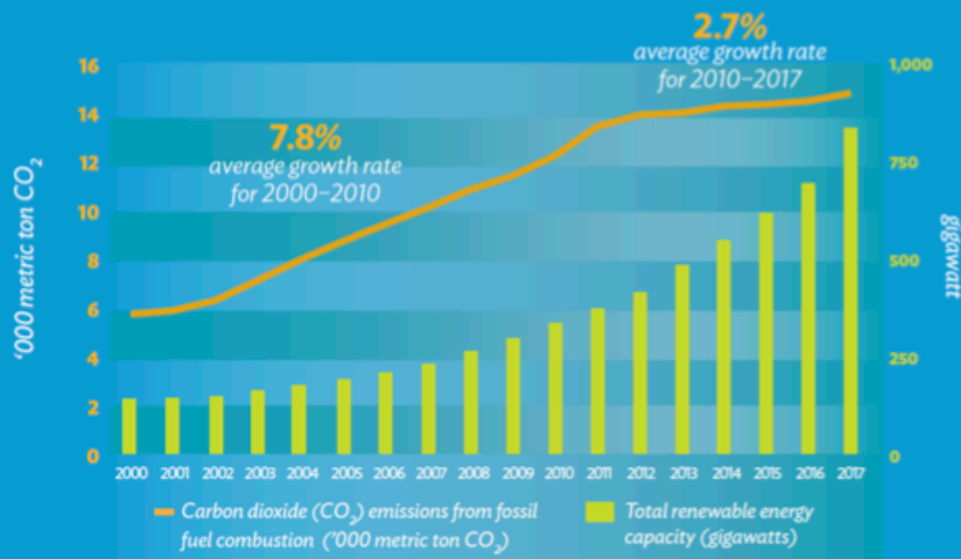
The World is **not** on Track to Limit Temperature Rise to 1.5°C



Notes: *on average, no or low overshoot.

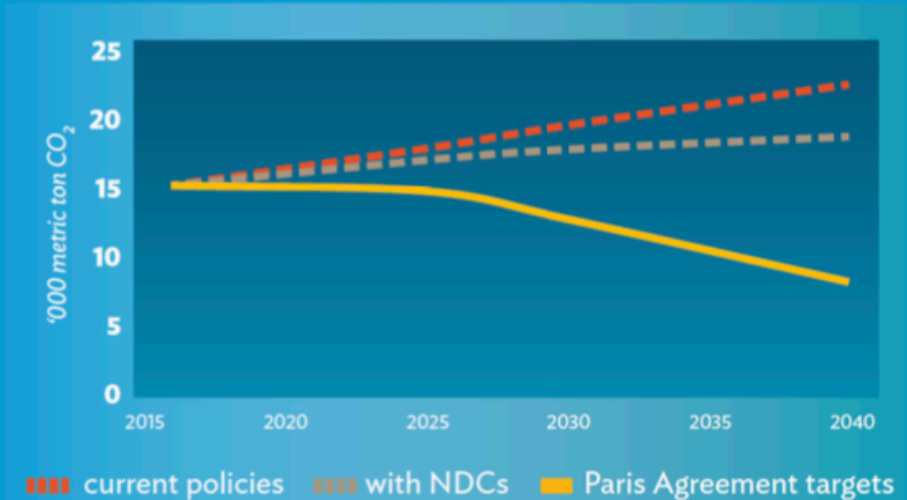
The battle against climate change will be won or lost in Asia and the Pacific

Carbon dioxide emissions from fossil fuel combustion and total renewable energy capacities in ADB DMCs



In 2017, the PRC's renewable energy capacity reached **696 gigawatts**, ranking first among all countries.

THE EMISSIONS GAP IN ASIA AND THE PACIFIC*
Outlook vs Paris Agreement Target



* CO₂ emissions from fossil fuel combustion for Asia Pacific³ for scenarios (Current Policies, New Policies, and Sustainable Development) in World Energy Outlook 2018

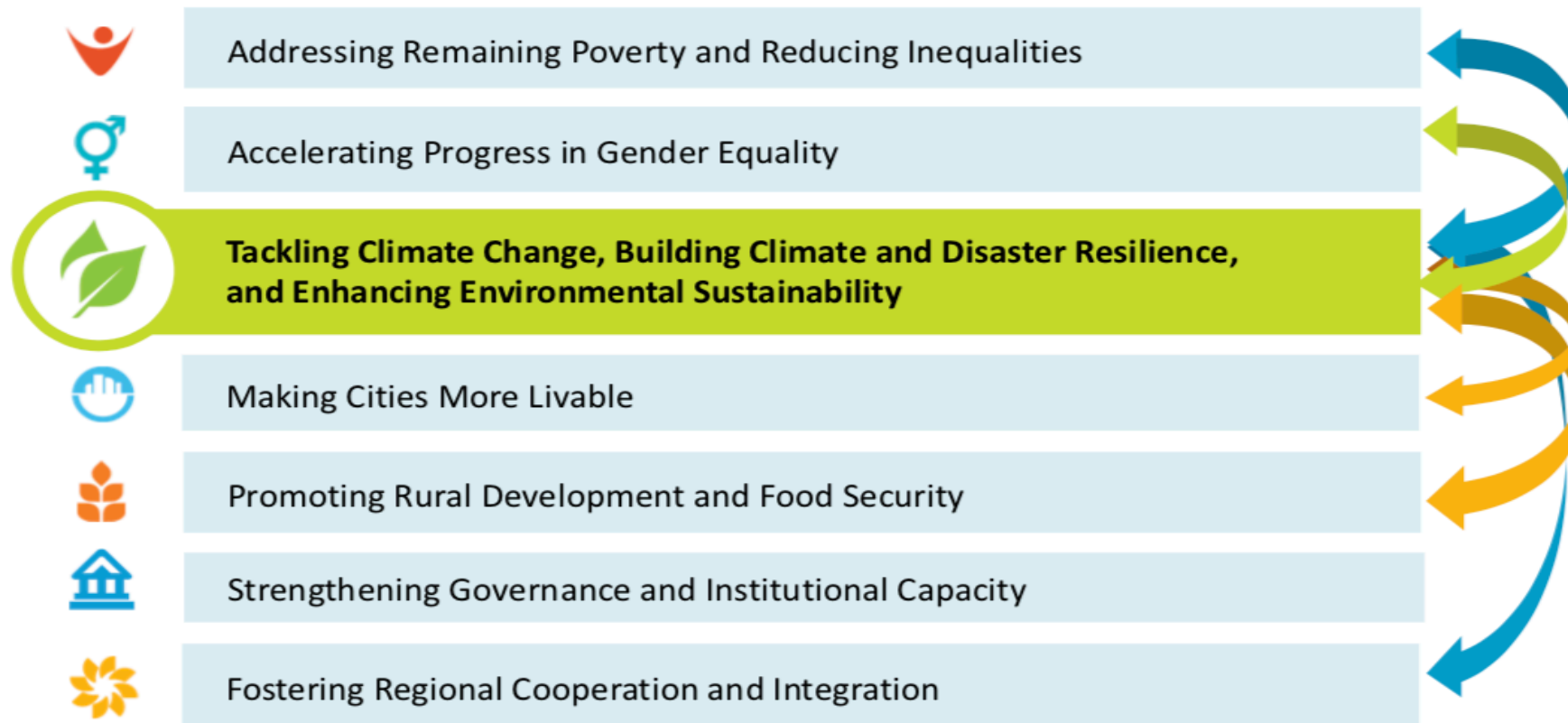
ADB

ADB

Priorities of ADB on Climate Change and Disaster Risk Management



Seven Operational Priorities



Target 75% of ADB's of the number of committed operations
(on a 3-year rolling average) will support climate mitigation and adaptation by 2030



Target Climate finance from ADB's own resources reach \$80 billion (2019-2030)

ADB's Climate Finance Target by 2020



Target under the Corporate Results Framework:

ADB-assisted projects that support climate mitigation and/or adaptation: **45% for ADB, 35% for ADF**

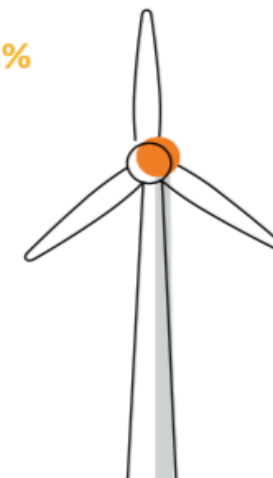


Funding for tackling climate change will rise to **around 30%** of its overall financing



ADB will double its annual climate financing to

**\$6
billion**



OUT OF THE \$6 BILLION

**\$4
billion**

will be dedicated to **mitigation** through scaling up support for renewable energy, energy efficiency, sustainable transport, and building smart cities.

**\$2
billion**

will be **adaptation** through more resilient infrastructure, climate-smart agriculture, and better preparation for climate-related disasters.





Clean Energy

- Expand **demand side** energy efficiency projects (e.g. electrical lighting), requiring new business models
- Increase **cross sectoral projects** (finance, urban, transport, water, agriculture etc.) requiring new financing instruments; integrated approach, e.g. **low carbon cities**



Sustainable urban development

- Promote an integrated approach to address climate risks.
- Knowledge exchange on climate mitigation and adaptation measures.
- Build capacities of cities to utilize climate finance to achieve local environmental improvement objectives.
- Link nationally determined contribution frameworks to city-level greenhouse gas accounting.



Sustainable transport

- Focus on low carbon transport modes (public transport, railways, e-vehicles)
- Ensure climate resilience in project design (additional drainage, raised road levels, storm surge protection)
- Achieving ADB climate change targets in transport sector support

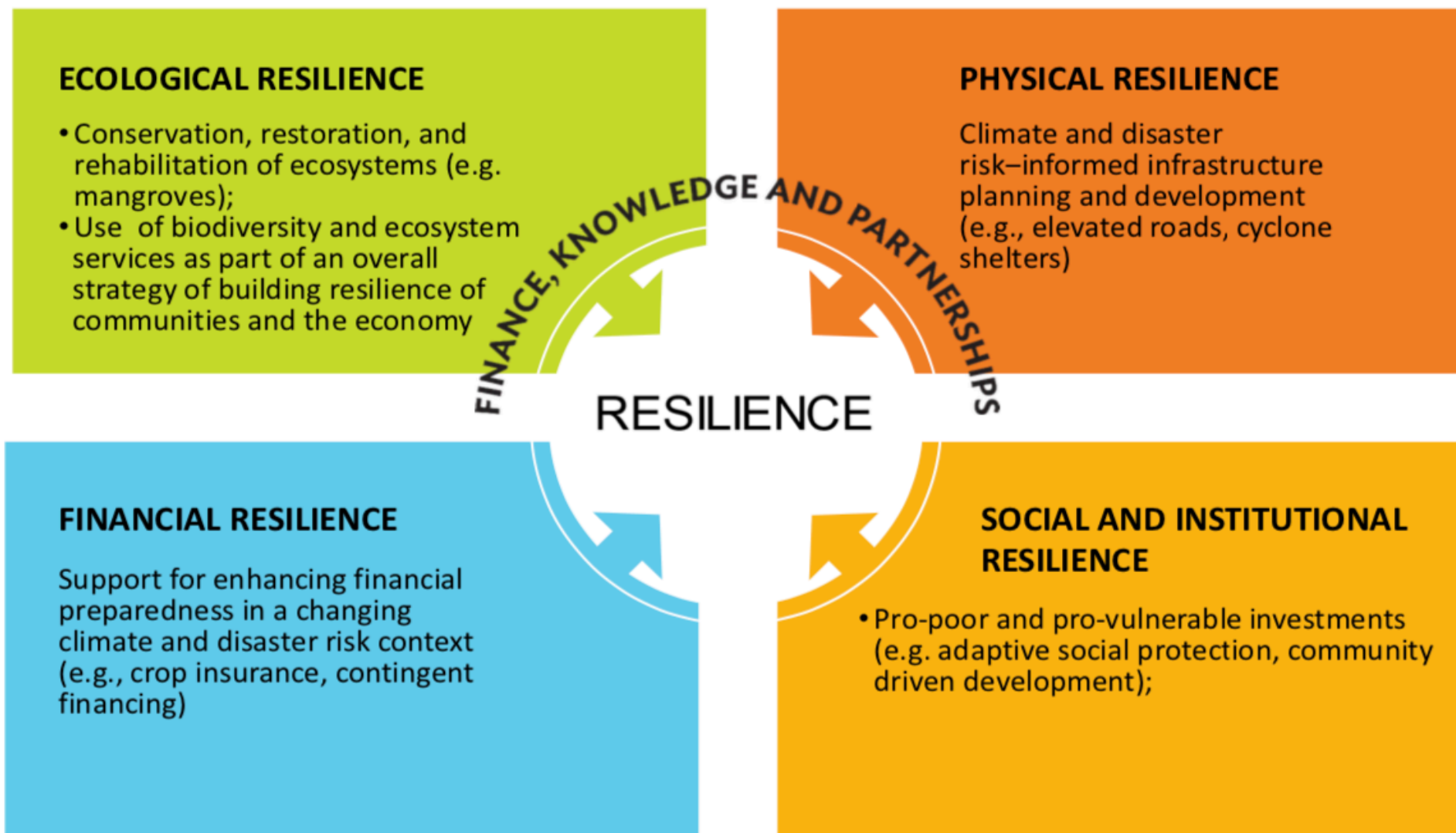


Climate-smart agriculture

- Explore new approaches, innovative ideas, and partnerships to ensure ADB investments are climate-smart by 2030
- Identify adaptation and mitigation measures to integrate in project pipelines
- Prepare guidance notes to track climate finance investments



Comprehensive Approach to Climate and Disaster Resilience



ADB

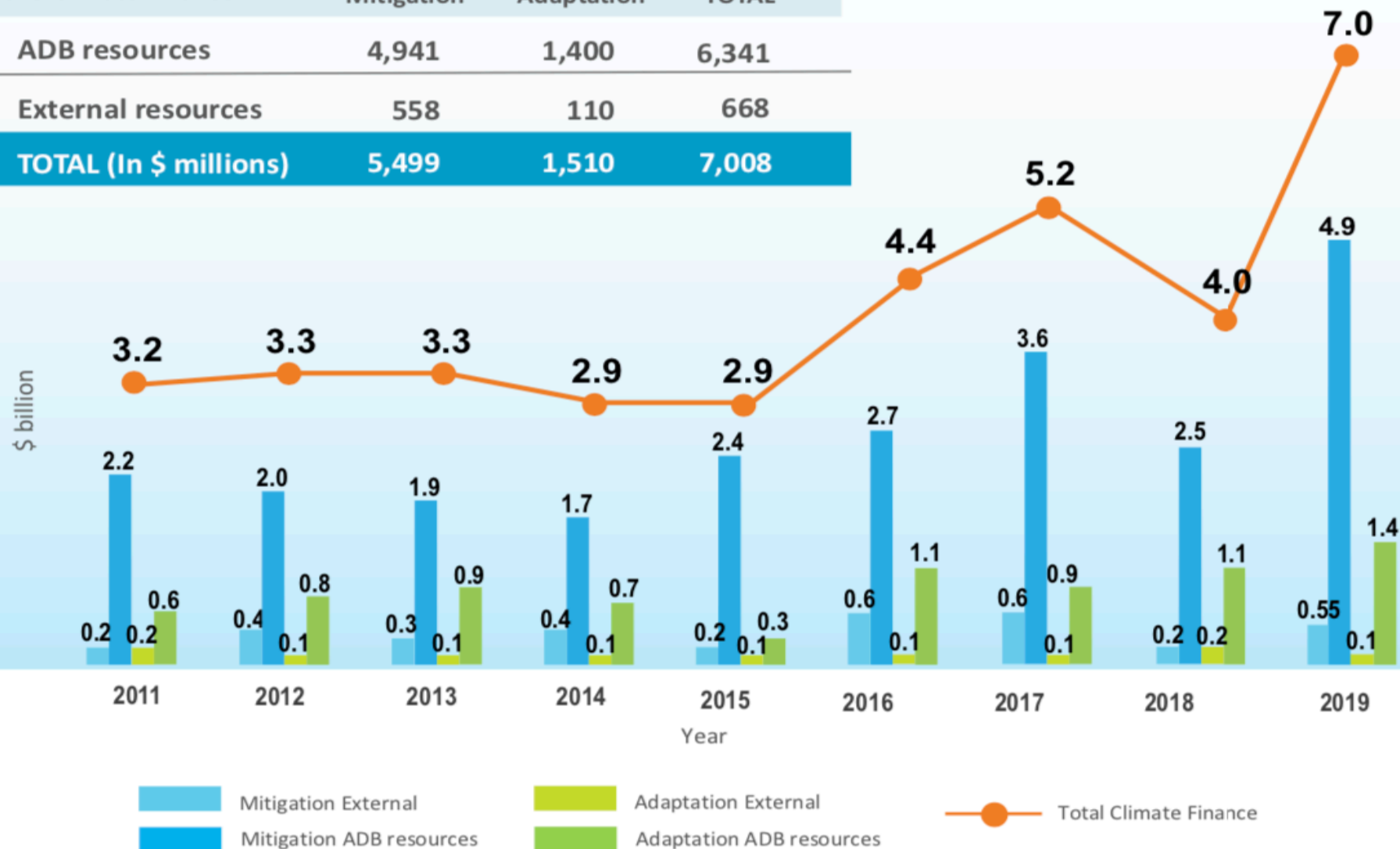
ADB

Climate and Disaster Risk Management Finance



ADB Climate Finance Approvals

2019 Climate Finance	Mitigation	Adaptation	TOTAL
ADB resources	4,941	1,400	6,341
External resources	558	110	668
TOTAL (In \$ millions)	5,499	1,510	7,008



Deploying concessional resources

Internally managed resources (ADB donor trust funds and special funds)

- Climate Change Fund (CCF)
- Clean Energy Financing Partnership Facility (CEFPF)
- Urban Climate Change Resilience Trust Fund (UCCRTF)
- Asia-Pacific Climate Finance Fund (ACliFF)
- High Level Technology Fund (HLTF)
- Others with bilaterals

Multilateral funds

- Climate Investment Funds (CIF)
- Global Environment Facility (GEF)
- Green Climate Fund (GCF)

Maximizing market mechanisms

- **Upfront carbon finance**
 - Asia Pacific Carbon Fund
 - Future Carbon Fund
- **Carbon Market Technical Support Facility**
 - Clean Development Mechanism support
 - domestic emissions trading
- **Japan Fund for the Joint Crediting Mechanism**
- **Green and Climate Bonds**
- Supporting **other market mechanisms** (e.g. renewable energy credits; feed-in tariffs)

Catalyzing private capital

- **Direct project finance** (lending, guarantees, syndications), and equity investment
- **Public private partnerships: (PPPs)** working with client DMCs across stages of PPPs

Finance: Deploying Concessional Resources from Multilateral Funds

Established in **2010** to channel climate finance, with pledges of **\$10.3 billion from 43 state governments***

ADB's total GCF Funding to date: **\$473 million**

Green Climate Fund (GCF)

has so far committed **\$5.6 billion to**



124 projects globally



Established in **2008** represents one of the first global efforts to invest in a dedicated climate finance vehicle.

Total CIF FUNDING for ADB DMCs

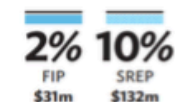
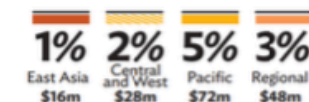
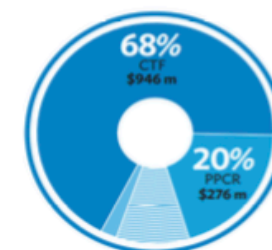
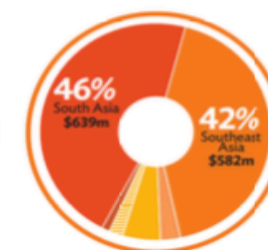
\$ 3.2 billion

\$ 1.39 billion

44%

Total CIF FUNDING administered by ADB

Note: Out of the \$1.39 billion ADB CIF Portfolio, total project funds approved to date is \$1.28 billion (92%)



*First replenishment received \$9.8 billion in pledges from 28 governments including two additional EU member states with new pledges during the Replenishment Pledging Conference held in Paris on 24-25 October 2019.

CTF=Clean Technology Fund, FIP=Forest Investment Program, PPCR=Pilot Program for Climate Resilience, SREP=Scaling Up Renewable Energy in Low Income Countries Program

Established in

2010

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\$10.3 billion from 43 state governments*

Green Climate Fund

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124
projects
globally

ADB Project	Total Project Cost (in \$ million)	Type and Approval Date	Total GFC Funding (in \$ million)
Fiji Urban Water Supply and Wastewater Management Project	100 (Tranche 1)	Adaptation November 2015	31 (grant)
Pacific Islands Renewable Energy Investment Program	sum of subprojects	Mitigation November 2016	5 (grant)
Cook Islands Renewable Energy Subproject	14		12 (grant)
Nauru: Sustainable and Climate-Resilient Connectivity Project (formerly Port Development Project)	65	Mitigation and adaptation October 2017	27 (grant)
Tajikistan: Institutional Development of the State Agency for Hydrometeorology	11	Adaptation February 2018	5 (grant)
Cambodia: Climate-Friendly Agribusiness Value Chains Sector Project	140	Mitigation and adaptation February 2018	10 (loan) 30 (grant)
Mongolia: Ulaanbaatar Green Affordable Housing and Resilient Urban Renewal Project (AHURP)	544	Mitigation and adaptation February 2018	95 (loan) 50 (grant)
Kiribati South Tarawa Water Supply Project	58	Mitigation and adaptation October 2018	29 (grant)
Tonga Renewable Energy Project (TREP) under the Pacific Islands Renewable Energy Investment Program	53	Mitigation October 2018	30 (grant)
Pakistan Green Bus Rapid Transit	585	Mitigation October 2018	21 (grant), 29 (loan)
Shandong Green Development Fund	1200	Mitigation and Adaptation November 2019	100 (loan)
Approved Total			473

*First replenishment received \$9.8 billion in pledges from 28 governments including two additional EU member states with pledges during the Replenishment Pledging Conference held in Paris on 24-25 October 2019.

Ireland Trust Fund for Building Climate Change and Disaster Resilience in Small Island Developing States (SIDS)

- established by ADB and the Government of Ireland in May 2019
- committing to an initial 6-year program of funding of **€12 million (\$13.5 million)** for the period 2019 to 2024.
- primarily supports technical assistance and capacity development in the SIDS, through activities such as financing climate-proof infrastructure, helping countries plan for and respond to climate change, and leveraging global climate resources for mitigation and adaptation efforts
- aims to increase the preparedness and resilience of SIDS to disasters caused by natural hazards and to the impact of climate change; expected outcome of the fund is an increased number of investments in climate change and disaster resilience

Three proposals currently under consideration:

- i. Regional Technical Assistance (TA): Pacific Disaster Resilience Program (8 countries)
- ii. Tonga - Support to the Tonga Climate Change Trust Fund (CCTF) for community adaptation projects
- iii. Vanuatu, Port Vila - Community Action Plans for Strengthening Urban Resilience



- A multi-donor trust fund approved on 28 April 2017 with up to US\$30 million contribution from Germany. The maximum amount of aggregate contributions is envisaged to not exceed \$200 million.
- ADB has initial contribution of US\$1 million towards an accompanying Technical Assistance to support the operationalization of ACliFF.
- ACliFF will support the assessment, development and provision of **financial risk management products** that can help unlock financing for climate investments in clean technologies and practices, which are necessary for climate change mitigation and adaptation; and improve resilience of the poor and vulnerable to the impacts of climate change.
- Total contributions received: **\$11.39 million** as of September 2019

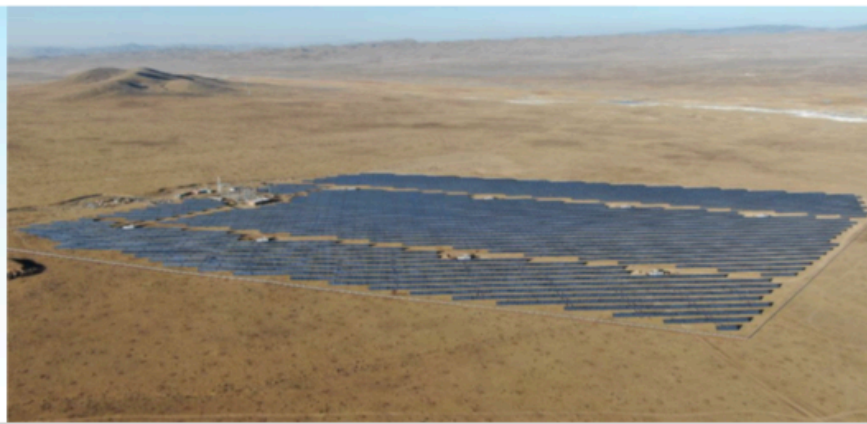


- A multi-donor trust fund approved on 28 April 2017 with up to **US\$30 million** contribution from Germany; ADB has made an initial contribution of **US\$1 million** towards an accompanying Technical Assistance to support the operationalization of ACliFF.
- ACliFF supports the assessment, development, and provision of **financial risk management products** addressing climate investments and extreme weather risks

2020 ACliFF Pipeline approvals (in \$'000)

Project	Total	Direct Charges	Investment Grants
Bangladesh: Scaling up Weather Index-Based Crop Insurance Pilot Project	200	200	
Afghanistan: Wind Project	2,000		2,000
Pacific: Renewable Energy Guarantee Program	3,200	200	3,000
Philippines: City Disaster Insurance Pool	5,000	200	4,800
Regional: Climate Disaster Facility for Microfinance Institutions	190	190	
Total	10,590	790	9,800

- established in April 2017 with a **CAD \$200 million contribution (US\$149.5 as of September)**
- designed to support greater **private sector participation** in climate change mitigation and adaptation in low and lower middle income countries and upper middle-income small island developing states in Asia and the Pacific.
- will seek to **promote gender equality and the empowerment of women** and girls in projects supported by the fund.
- will aim to play a key role in helping the private sector **overcome development risks** (including market risks, technology risks, financing risks, regulatory and other risks) by offering financing on **concessional terms** and conditions to projects that would not proceed solely on a commercial basis.



Sersang Khushig Khundii Solar Project

provided a technical assistance grant to offset first mover costs and to catalyze the financing of ADB's first private sector solar power project in Mongolia

Innovative Projects and Initiatives

Cambodia: National Solar Park Project



Innovative Project Design

TOTAL FINANCING: \$21.65 million

- \$ 7.64 million COL/ADF
- \$ 11 million
Strategic Climate Fund (loan)
- \$ 3 million
Strategic Climate Fund (grant)

DATE APPROVED 23 May 2019

TA 9736-CAM: Capacity Development
in the Electric Utility Industry
\$500,000 Republic of Korea e-Asia and
Knowledge Partnership Fund (grant)

TOTAL CLIMATE FINANCE \$21.64 million

TOTAL ADAPTATION FINANCE
\$1.17 million

TOTAL MITIGATION FINANCE
\$6.47 million (COL/ADF)
\$14 million (Strategic Climate Fund)

Collaboration between:

- Southeast Asia Department
- Office of Public-Private Partnership
- Private Sector Operations Department

CONTEXT

Project will support the expanded deployment of solar photovoltaic power plants in Cambodia and address the country's need to (i) expand low-cost power generation; (ii) diversify the power generation mix with an increase in the percentage of clean energy, in line with its greenhouse gas emission reduction targets; and (iii) expand the use of competitive tenders and other global best practices in the energy sector.

DESCRIPTION

The project will have two outputs: (i) a 100 MW solar power park in Kampong Chhnang Province and a transmission interconnection system to grid substation 6 (GS6) near the Phnom Penh demand center to supply power to the national grid.; and (ii) strengthened capacity of Electricite du Cambodge (EDC) in solar power plant construction and operation, project design and supervision, grid integration, and competitive procurement. EDC with ADB's support has tendered out the first 60 MW of generating capacity at the solar park to the private sector (independent power producer).

UNIQUE FEATURES

- (i) first large-scale solar park in Southeast Asia
- (ii) exhibits **ONE ADB** approach (OPPP, SERD and PSOD working together) in providing end-to end support to the country
- (iii) obtained the lowest solar procurement price in the ASEAN in 2019 at 3.88 cents/kilo watt-hour for the electricity

PRC: Shandong Green Development Fund Project (SGDF)



Innovative Financing

TOTAL FINANCING: \$ 200 million (w/o cofinancing)

- **\$100 million (OCR)**
- **\$100 million**
Green Climate Fund (concessional loan)
- **\$ 84.53 million**
Agence Francaise de Developpement
(Not ADB Administered)
- **\$113.69 million**
KfW Bankengruppe
(Not ADB Administered)

DATE APPROVED 25 September 2019

TOTAL CLIMATE FINANCE: \$200 million

TOTAL ADAPTATION FINANCE

\$25 million (OCR)
\$25 million (GCF)

TOTAL MITIGATION FINANCE

\$75 million (OCR)
\$75 million (GCF)

East Asia Department

CONTEXT

PRC plays a pivotal role in managing the climate change challenge in Asia and the Pacific. Given the country's current level of greenhouse gas (GHG) emissions and climate vulnerability, there is a vast need for climate-related investments going beyond business as usual to underpin its development targets. With high reliance on coal power and heavy industry, Shandong Province is initiating systemic interventions to build climate resilience and decarbonize its economy.

DESCRIPTION

The project will create a "fund" to catalyze private, institutional and commercial (PIC) capital for the development of climate positive infrastructure and business in Shandong Province and will support a portfolio of mitigation and adaptation subprojects assessed against both climate and financial eligibility criteria. It will also enhance knowledge and skills of local governments, civil society, and private sector to prepare climate-positive subprojects

UNIQUE FEATURE

The project will have a leveraging effect with SGDF financing and will be time bound and targeted. It will incentivize subprojects to adopt green procurement standards, as greening a subproject's supply chain such that it shifts from "good practices" to "advanced benefits" will enable access to better financing terms and conditions from the SGDF. The project will also adopt SOURCE, a multilateral digital platform to fast-track the delivery of quality infrastructure projects.

Pacific Renewable Energy Program



Innovative Project Design

TOTAL FINANCING: \$100 million

- \$50 million
OCR
- \$50 million
Partial Risk Guarantee

DATE APPROVED 17 April 2019

TOTAL CLIMATE FINANCE: \$80 million

TOTAL MITIGATION FINANCE

\$40 million (OCR)
\$40 million (Guarantee)

Collaboration between:

- Private Sector Operations Department
- Pacific Department

CONTEXT ADB's 14 Pacific DMCs are undergoing a structural transition from power generation based on fossil fuels to generation from renewable energy sources, in an effort to lower power generation costs, reduce greenhouse gas emissions, and improve energy security. However, lack of technical capacity of power utilities in the renewable energy sector limits the internal skills available to manage grids that are moving rapidly from relatively simple single-source generation systems (diesel) to grids with multiple intermittent renewable energy sources. Private sector investment in owning and operating intermittent renewable energy generation facilities is crucial to supplementing local capacity and filling the investment gap in the sector.

DESCRIPTION The program will provide a financing structure to support the power payment obligations of power utilities where governments are unable to guarantee a utility's offtake obligations under power purchase agreements due to fiscal constraints. **The output will support an estimated 5 separate renewable energy projects in Pacific DMCs over a 5-year period.**

UNIQUE FEATURE The program was developed by PSOD (PSIF2) and PARD (PAEN) under a **One ADB** approach to provide a credit enhancement structure for supporting the credit worthiness of Pacific power utilities where governments are no longer able or willing to provide government guarantees for their power utility's offtake obligations. It was designed to encourage private sector investment by using donor funds to backstop the power payment obligations of the power utilities. The design for each project under the program includes one or more of the following forms of financing support: partial risk guarantee, direct loan, letter of credit, and technical assistance.

Myanmar: Resilient Community Development Project



Innovative Project Design

TOTAL FINANCING \$225.58 million

- **\$10 million**
ADF (Grant)
- **\$ 185 million**
COL (Concessional Loan)
- **\$27.58 million**
Asia Investment Facility
- **\$3 million**
Japan Fund for Poverty Reduction

DATE APPROVED 26 November 2019

TOTAL CLIMATE FINANCE: \$59.54 million

TOTAL ADAPTATION FINANCE \$59.54 million

Collaboration between:

- Southeast Asia Department

CONTEXT

Myanmar ranks among the highest in the 2017 Global Climate Risk Index. Almost the entire country is affected by a range of natural hazards. Project areas are particularly prone to landslides, floods, droughts, cyclones and storms depending on their location. Resilience-building measures can support communities in coping with Climate Change and Disaster risk.

DESCRIPTION

The project will improve standard of living and community resilience through: (i) Climate- and disaster-resilient community infrastructure (e.g. cyclone shelters, water harvesting infra, embankment and water management); (ii) Resilient livelihood activities for the poor (e.g. income diversification, adaptive crops); (iii) Institutional and organizational capacity building of communities and government (e.g. climate and disaster information included in Village Development Plans).

UNIQUE FEATURE

1. Builds on TA Strengthening Climate and Disaster Resilience of Myanmar Communities which provided climate and disaster risk modeling information and climate forecasts.
2. Includes a Disaster contingency feature.
3. Uses climate projections and disaster data to select cluster project areas.



Pacific Disaster Resilience Program (Phase 2)



Innovative Financing

TOTAL FINANCING: \$24 million

- \$21 million
ADF
- \$3 million
Concessional OCR

DATE APPROVED 27 September 2019

TOTAL FINANCING: \$9.6 million

TOTAL ADAPTATION FINANCE
\$8.4 million (ADF)
\$1.2 million (Concessional OCR)

Pacific Department

CONTEXT

ADB's Pacific DMCs are highly exposed to many different types of natural hazards, including tropical cyclones, earthquakes, tsunamis, volcanic eruptions, floods, and droughts. The region also experiences a disproportionately high share of global disaster impacts relative to its economic and demographic size. Disaster risk is increasing because of climate change.

DESCRIPTION

The project will provide a source of financing for timely disaster response and early recovery and support policy actions to strengthen policy and institutional arrangements for disaster risk management (DRM), improve the disaster and climate resilience of physical infrastructure, and expand disaster risk financing. The program is the second phase of the Pacific Disaster Resilience Program, approved in December 2017 for Samoa, Tonga, and Tuvalu. It will provide a second round of contingent financing for **Tonga** and add three new countries (the **Marshall Islands**, the **Federated States of Micronesia**, and **Solomon Islands**) to the program.

UNIQUE FEATURE

ADB's first use of the new Contingent Disaster Financing option under the policy-based loan modality.

In December 2019, this program was approved for the **Cook Islands**, marking the first time that the CDF option has been applied to a regular OCR-only country. After the occurrence of a qualifying disaster during the term of the program, the government may request one or more loans of up to a total of \$10 million. At that time, ADB and the Cook Islands will enter into a short-form agreement that will specify the actual loan amount requested by the Cook Islands, as well as the lending terms, and only then will ADB commit the requested amount. Upon signing the short-form agreement, there will be a one-time front-end fee of 0.10% of the committed loan amount.

Bangladesh: Dhaka and Western Zone Transmission Grid Expansion Project



Innovative Technology

TOTAL FINANCING: \$500.75 million

- \$300 million OCR
- \$200 million Asian Infrastructure Investment Bank (AIIB) (loan)
- \$ 0.75 million People's Republic of China Poverty Reduction and Regional Cooperation Fund (grant)

DATE APPROVED 8 November 2019

TOTAL CLIMATE FINANCE: \$315 million

TOTAL ADAPTATION FINANCE

\$70.70 million (OCR)

\$47.10 million (AIIB)

TOTAL MITIGATION FINANCE

\$117.20 million (OCR)

\$80 million (AIIB)

South Asia Department

CONTEXT

Despite its economic success, Bangladesh faces major challenges in maintaining growth trends and reducing poverty because of infrastructure deficiencies in the energy sector and elsewhere. To address these deficiencies, the government is prioritizing the provision of modern, reliable, and affordable energy services to those who lack access. The project will contribute to the goal of the Government of Bangladesh to achieve electricity for all by 2021.

DESCRIPTION

The project will help expand and strengthen the transmission networks in the Greater Dhaka area and western zone of Bangladesh, improve financial management in Power Grid Company of Bangladesh Limited (PGCB), and apply best practices in operations and maintenance. It will: (i) construct 40 kilometers (km) of transmission lines and 4,450 megavolt-amperes (MVA) of substations in Greater Dhaka; (ii) construct of 368 km of transmission lines, 3,070 MVA of substations, and 20 bay extensions in the western zone; and (iii) establish an enterprise resource planning (ERP) system and a drone inspection center to strengthen capacity in asset management and operation and maintenance.

UNIQUE FEATURE

The project uses gas insulated substations that will address climate risks; uses low-sag power line conductors to deal with high temperatures drastically cutting systems losses; it will also employ drones that can be operated remotely to monitor transmission lines. Project design also includes capacity building, including promoting women employment in technical positions at the drone inspection center.

Regional: Legal Readiness for Climate Finance and Climate Investments

TOTAL FINANCING

- **\$0.875 million**
TSAF

DATE APPROVED 16 August 2016
DATE CLOSING 30 June 2020

TOTAL CLIMATE FINANCE
\$0.88 million

TOTAL ADAPTATION FINANCE
\$0.44 million

TOTAL MITIGATION FINANCE
\$0.44 million

Office of the General Counsel

CONTEXT

Legal readiness for climate finance will become increasingly critical as DMCs start to translate their commitments under the Paris Agreement into specific actions on the ground. ADB provides TA to help its DMCs identify legal barriers to accessing climate and disaster finance, find opportunities for legal reform to address legal barriers to finance, and recommend ways to address interlinked regulatory, institutional, and administrative impediments to such finance.

UNIQUE RESULT:

LAO PDR

- ✓ ***Climate change decree enacted*** providing an umbrella framework for climate finance and coordination mechanisms for climate change monitoring and reporting requirements. Currently *developing a national climate change strategy*
- ✓ ***Disaster management law enacted*** setting out coordination mechanisms among the national and sub-national entities involved in disaster prevention, response and recovery efforts. Currently *developing a national disaster risk reduction strategy and related infrastructure*

FIJI

- ✓ ***Climate Change Bill introduced*** providing a comprehensive framework to guide Fiji's response to climate change, including key operative provisions of the Paris Agreement, governance structure and climate finance mechanisms

NAURU

- ✓ ***Legal assessment conducted*** identifying the absence of legal framework to support renewable energy projects and to regulate an energy market in general. Currently *developing a new energy law* to fill the gap.

Total Cost: \$100 million (OCR)

Status: Proposed

CONTEXT

The Philippines is one of the world's most disaster-prone countries. Urban areas account for a high and increasing share of the country's disaster risk, with 70% of GDP already generated in urban areas. City governments face significant challenges in securing timely financing for rapid early recovery in the event of major disasters.

DESCRIPTION

The proposed Philippine City Disaster Insurance Pool Project (PCDIP) will provide seed capital to establish and capitalize a **pooled** insurance company from which cities can purchase parametric insurance against **typhoons** and **earthquakes**. It will support cities to become self-sustaining in managing disaster risk and rehabilitating their infrastructure. These 10 cities were chosen to pilot PCDIP and are expected to be the first batch of policyholders: Bacolod, Baguio, Butuan, Caloocan, Dagupan, Davao, Iloilo, Marikina, Paranaque and Quezon City. 7 more cities joined consultations.

UNIQUE FEATURE

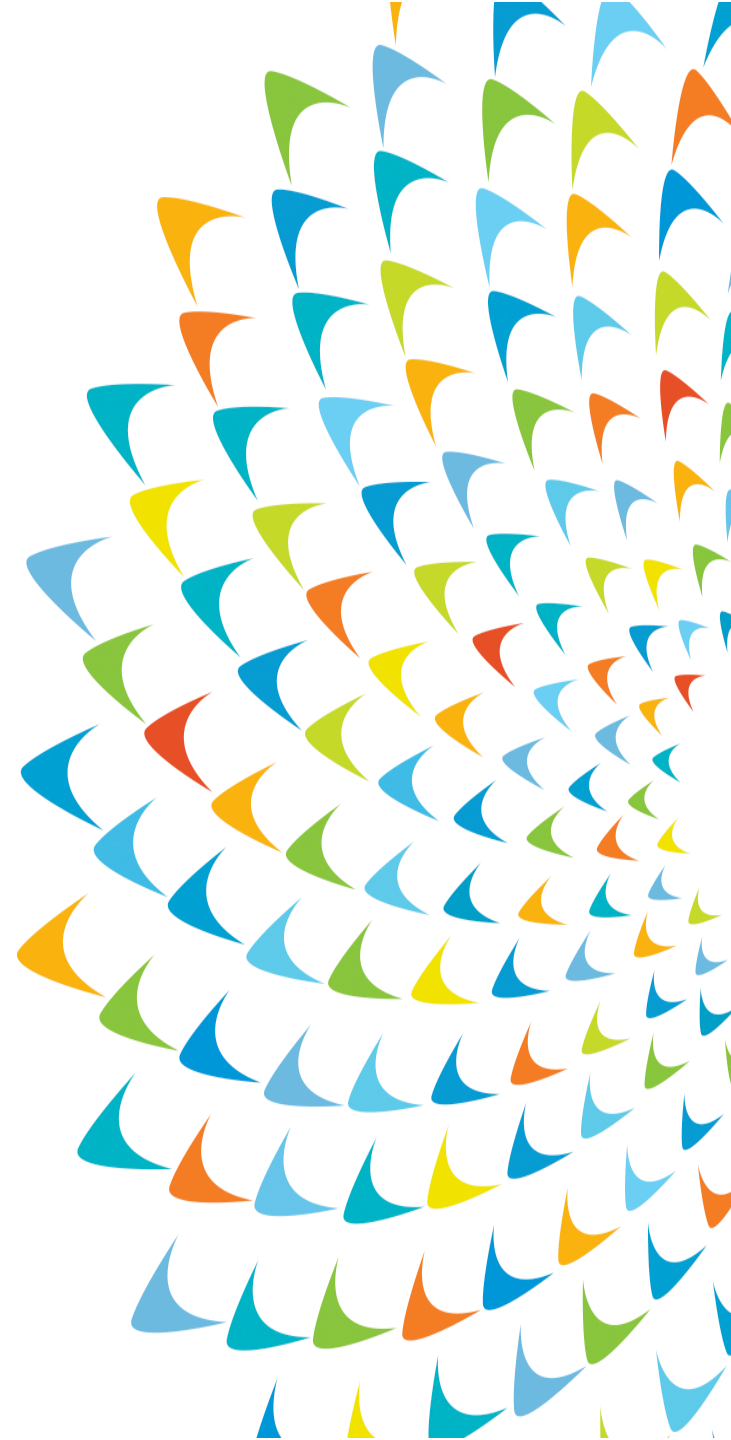
PCDIP will be the world's first city insurance pool. The risk pooling mechanism will reduce premium costs via risk diversification, economies of scale, and profit retention and provide payouts within 15 business days of qualifying disasters.

ADB

ADB's Water Sector Operations



ADB



ADB Countries with High Baseline Water Stress - August 2019

Extremely High Water Stress

- India
- Pakistan
- Turkmenistan

High Water Stress

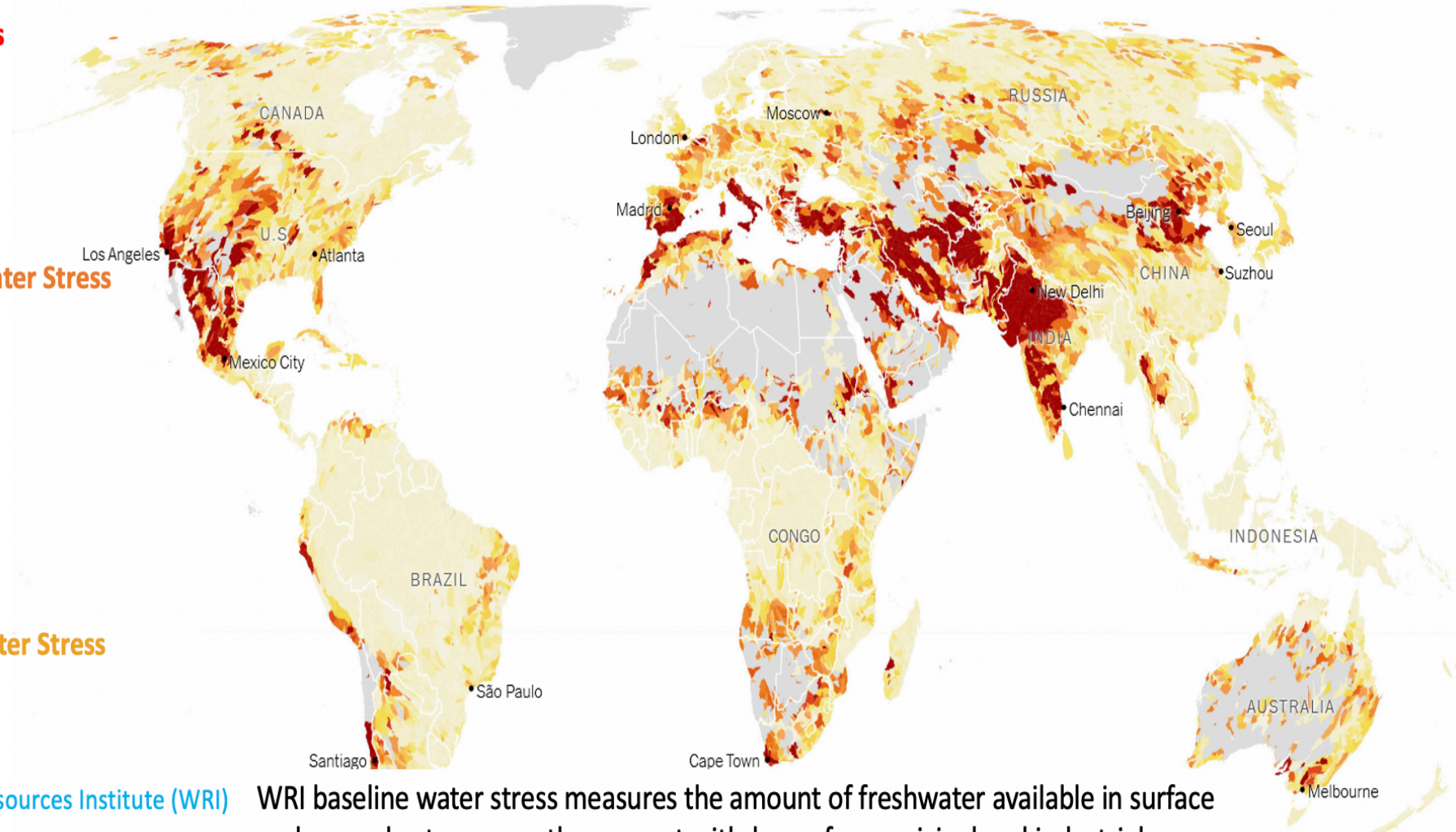
- Uzbekistan
- Afghanistan
- Armenia
- Kyrgyzstan
- Nepal

Medium-High Water Stress

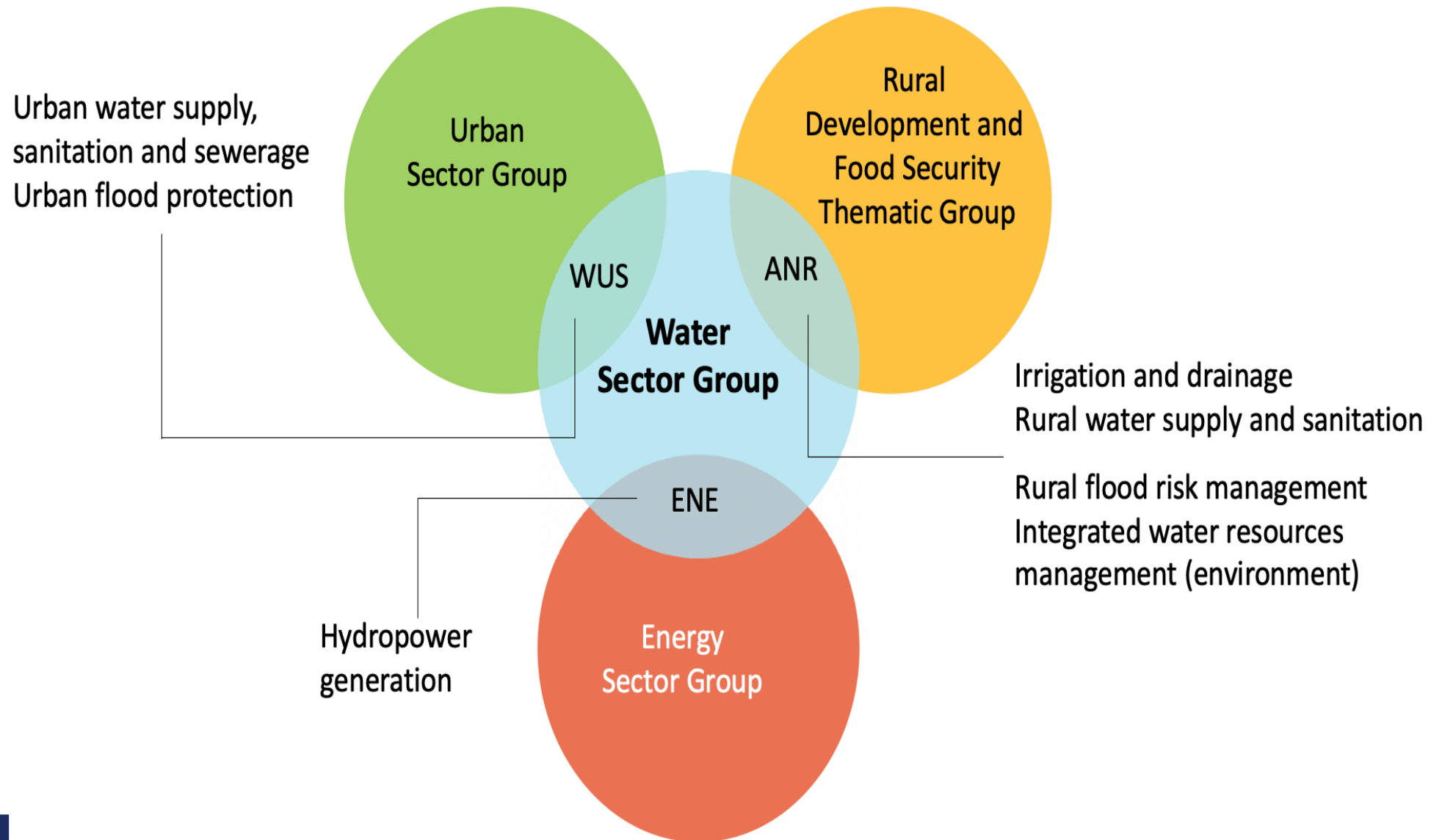
- Thailand
- Azerbaijan
- Australia
- Tajikistan
- South Korea
- Mongolia
- China
- Kazakhstan

Low-Medium Water Stress

- Philippines
- Georgia



Water is cross-cutting and links the water-food-energy security nexus

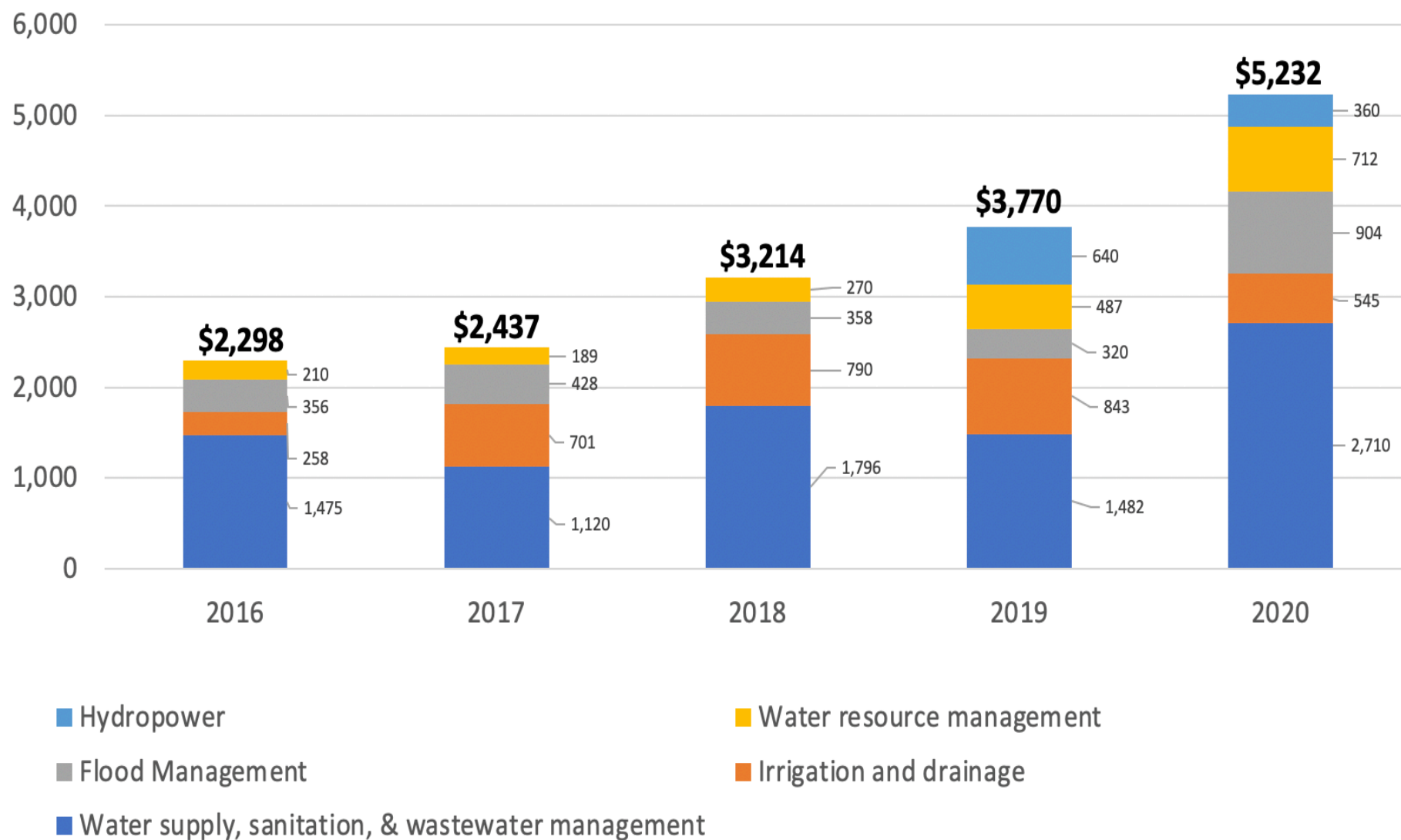


ANR = agriculture, natural resources, and rural development; ENE = energy;

WUS = water and other urban infrastructure services

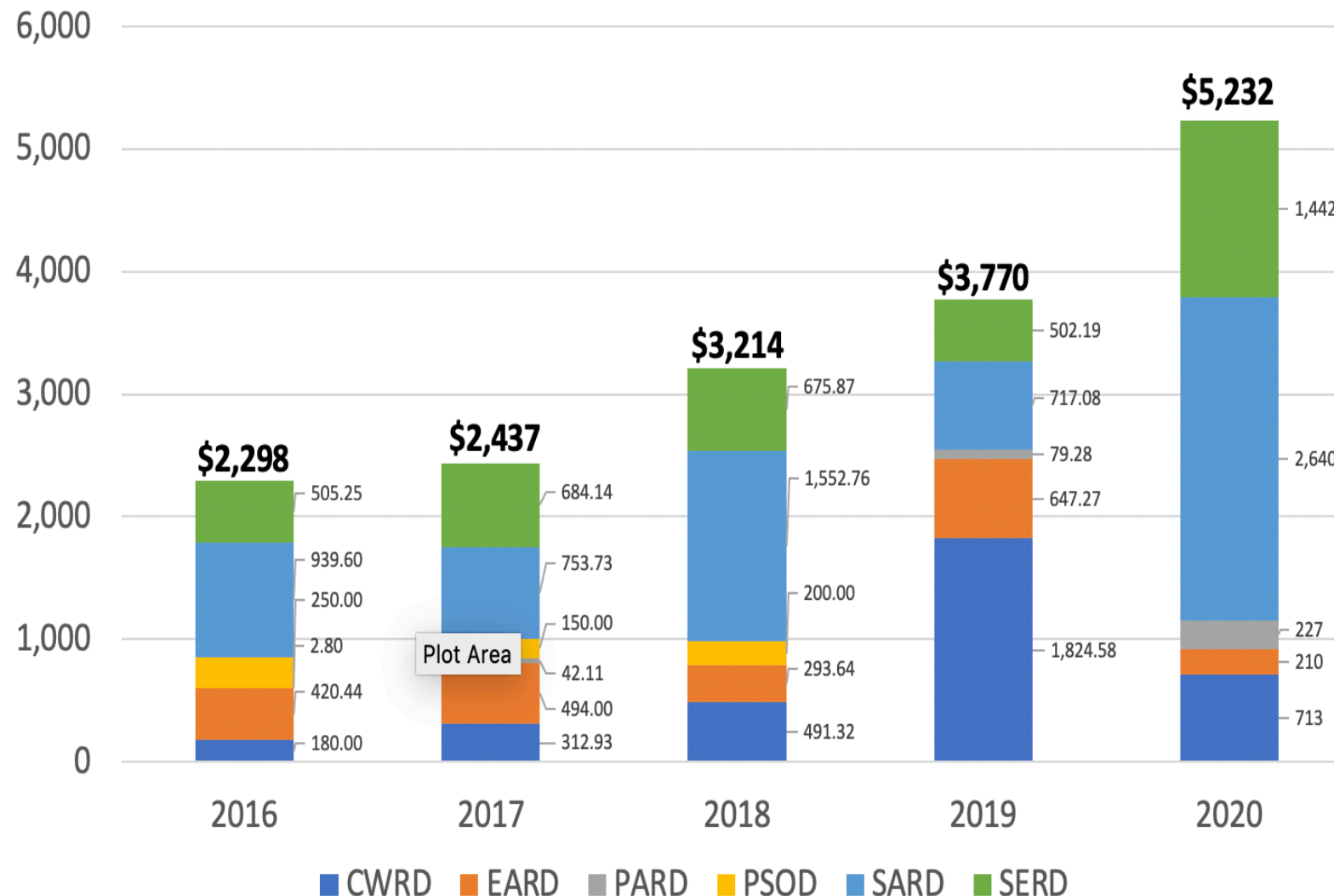
WSG Lending History and Pipeline by Subsector

(in \$ Million)



WSG Lending History and Pipeline by Operational Department

(in \$ Million)



ADB Climate Adaptation Finance 2016-2018 – \$3.47 billion

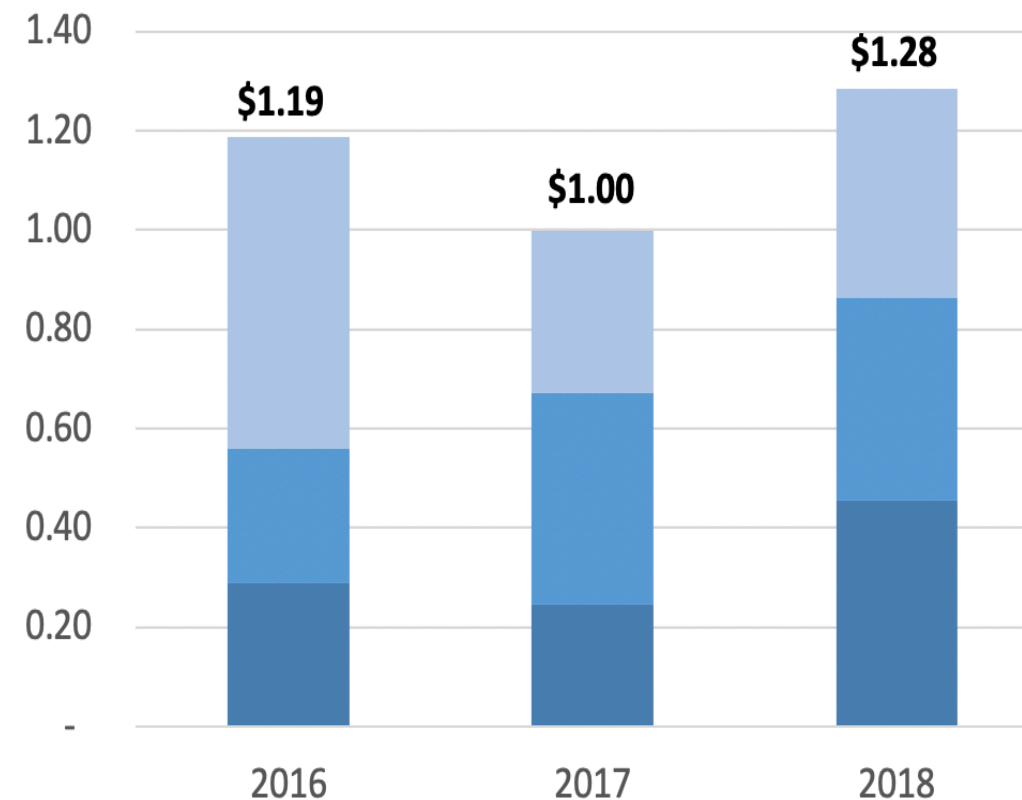
(in \$ billion)

**Water Projects comprise
60% (\$2.09 billion)
of ADB Adaptation Finance from 2016-2018**

Year	Water Component	Percentage of Total Adaptation
2016	\$0.56 billion	47%
2017	\$0.67 billion	67%
2018	\$0.86 billion	67%

For 2016-2018, water projects are part of:

- WUS: \$1.11 billion - such as flood protection works, improved urban drainage, diversifying water sources
- ANR: \$0.99 billion such as improving irrigation water productivity, coastal protection works



- Non-water related projects
- Water and other urban services (WUS)
- Agriculture, natural resources, and rural development (ANR)

Innovation Trends Highlighted in Water Projects

1. Technology and data management - *GIS for asset management, decision support systems, supervisory control and data acquisition (SCADA), smart customer meters, wireless sensor and pressure management, district metered areas, solar powered wastewater treatment, reuse of wastewater, remote sensing/satellite images for agriculture and disaster management*

- Georgia: Sustainable Water Supply and Sanitation Sector Development Program
- Lao PDR: Sustainable Rural Infrastructure and Watershed Management Sector Project
- India: Tamil Nadu Urban Flagship Investment Program
- Solomon Islands: Urban Water Supply and Sanitation Sector Project
- Indonesia: Emergency Assistance for Rehabilitation and Reconstruction

2. More innovative financing and transaction mechanisms - *results based lending, sector development programs, local currency, bonds, prepaid metering, public private partnership, design build operate contracts*

- Georgia: Sustainable Water Supply and Sanitation Sector Development Program
- Kazakhstan: Irrigation Rehabilitation Project

3. Focus on asset management - *asset management plans developed, sustainable financing /cost recovery, application of high technology/GIS, non-revenue water reduction*

- Georgia: Sustainable Water Supply and Sanitation Sector Development Program
- Kazakhstan: Irrigation Rehabilitation Project

Innovation Trends Highlighted in Water Projects

4. Governance, performance and capacity building reforms - *water users associations, utility and regulatory reforms, tariff setting, non-revenue water, private sector management, performance-based urban governance incentives, precision irrigation using remote sensing*

- People's Republic of China: Integrated Wastewater Management Project
- Bangladesh - Climate and Disaster Resilient Small-Scale Water Resources Management Project
- Georgia: Sustainable Water Supply and Sanitation Sector Development Program
- India: Tamil Nadu Urban Flagship Investment Program
- Lao PDR: Sustainable Rural Infrastructure and Watershed Management Sector Project

5. Integrated water sector activities, climate and resilience, environment – *stronger urban and rural linkages, environment conservation, promotion of nature-based solutions and sponge cities for flood management, disaster and climate resilient infrastructure*

- Indonesia: Emergency Assistance for Rehabilitation and Reconstruction
- People's Republic of China: Jilin Yanji Low-Carbon Climate-Resilient Healthy City Project
- People's Republic of China: Henan Dengzhou Project
- Lao PDR: Sustainable Rural Infrastructure and Watershed Management Sector Project
- Solomon Islands: Urban Water Supply and Sanitation Sector Project

People's Republic of China: Jilin Yanji Low-Carbon Climate-Resilient Healthy City Project

Improve urban livability through integrated solutions combining transit-oriented urban development, sponge city green infrastructure integrating river rehabilitation and flood risk management, improvements to water supply and wastewater management systems, and capacity building on low-carbon, climate-resilient and healthy city development.

Approach/ Design: Comprehensive urban transformation of northern half of the city focusing on a new BRT corridor, applying transit-oriented development (TOD) principles; Green open spaces integrating *sponge city*¹ green infrastructure to reduce flood risk and following universal design principles; Non-revenue water reduction and smart water supply system using cloud-based data processing, supported by geographic information system (GIS), real-time data from sensors throughout the water supply system (SCADA), and district metering to manage water losses (DMA); and Capacity building on climate-resilience, water safety planning, non-revenue water reduction.

Innovations: Integrated planning of land use, transport, infrastructure and green open space; sponge city master planning integrated with hydraulic modeling simulating green and gray infrastructure simultaneously to increase climate resilience; health impact assessment to bring out further health benefits (people walking, cycling and exercising, clean water) and water utility corporate governance.

Delivery mechanisms/modality: Project loan, during implementation promoting PPP for investment and operation of future BRT lines in Yanji; Technical inputs received from WSG Secretariat on water supply component design and utility twinning arrangement during project implementation.

¹ Sponge city is concept of comprehensive water resource management and name of government program in the PRC, designed to improve rainwater harvesting and reuse and improved flood risk management retaining stormwater for both natural infiltration into the groundwater and for urban reuse.

Approval: Q4 2019 (proposed)

Commitment: Q1 2020

Financing: sovereign
\$130 million – loan, OCR
\$152.5 million – government



Bangladesh: Climate and Disaster Resilient Small-Scale Water Resources Management Project

Agricultural and fisheries productivity improved through effective, participatory, sustainable small-scale water resources management incorporating climate and disaster resilience features in infrastructure and facilities, promoting climate and disaster tolerant crops and cropping practices, and introducing agricultural value chains.

Approach/ Design: The project will strengthen 'climate resilience' of farmers in Bangladesh by improving water resources management, irrigation and drainage, raising roads and flood embankments, and introducing crops that are less vulnerable to droughts and storms. It will include a subcomponent on agricultural value chain development; commodity-based farmers' organizations will be formed in association with food exporting companies. It will also strengthen extension and marketing of inland fisheries to further sustain and enhance benefits of upgraded infrastructure among farmers.

Innovations: Provide institutional support for the Local Government Engineering Board to incorporate climate and disaster resilience features into their master designs; collaboration with IFAD at project preparation stage to utilize their strength on value chain development and operations in Bangladesh.

Delivery mechanisms/modality: Sector development modality with advance contracting



OP1



OP3



OP5



OP6

Approval: Q3 2020 (proposed)

Commitment: Q4 2020

Financing: sovereign

\$100 million – loan (OCR)

\$40 million – from the International Fund for Agricultural Development (IFAD)



Indonesia: Emergency Assistance for Rehabilitation and Reconstruction (EARR)

Integrated “source to tap approach” for water demand management, wastewater management for reuse, watershed management for environmental and nature conservancy, and earth observation and data analytics



OP1



OP2



OP3



OP4



OP6

Approval: June 2019

Commitment: October 2019

Financing: sovereign, sector Loan
\$298 million (OCR)

Approach/ Design: The emergency assistance was responsive to the needs of the Sep 2018 earthquake, tsunami and liquefaction in Palu, Central Sulawesi. It will finance the reconstruction of severely damaged water intakes, the 42km long Palu-Sigi-Donggala (PASIGALA) raw water transmission system, and two water treatment plants. By considering a “source to tap” approach, the EARR will link upstream water resource management to downstream water distribution and provide piped water supply to 25,000 households.

Innovations: The EARR uses geo-spatial technologies for planning and monitoring in partnership with the European Space Agency and considers earthquake and hydrogeological conditions causing liquefaction to design infrastructure for long term resilience.

Delivery mechanisms/modality: The EARR is a collaboration between SEER and SEUW from processing through implementation and brings together two teams in the government – water resources and water supply. It has undertaken advance actions through TA Loans and utilized grant funding from Urban Climate Change Resilience Trust Fund to support master planning and post-disaster needs assessment at Palu, Central Sulawesi.



ADB's Energy Sector Operations

Energy Sector Operations Guiding Principles

Increased
deployment of
renewable energy,
energy efficiency

Integration of
advanced
technologies/
innovative business
models and financing
instruments

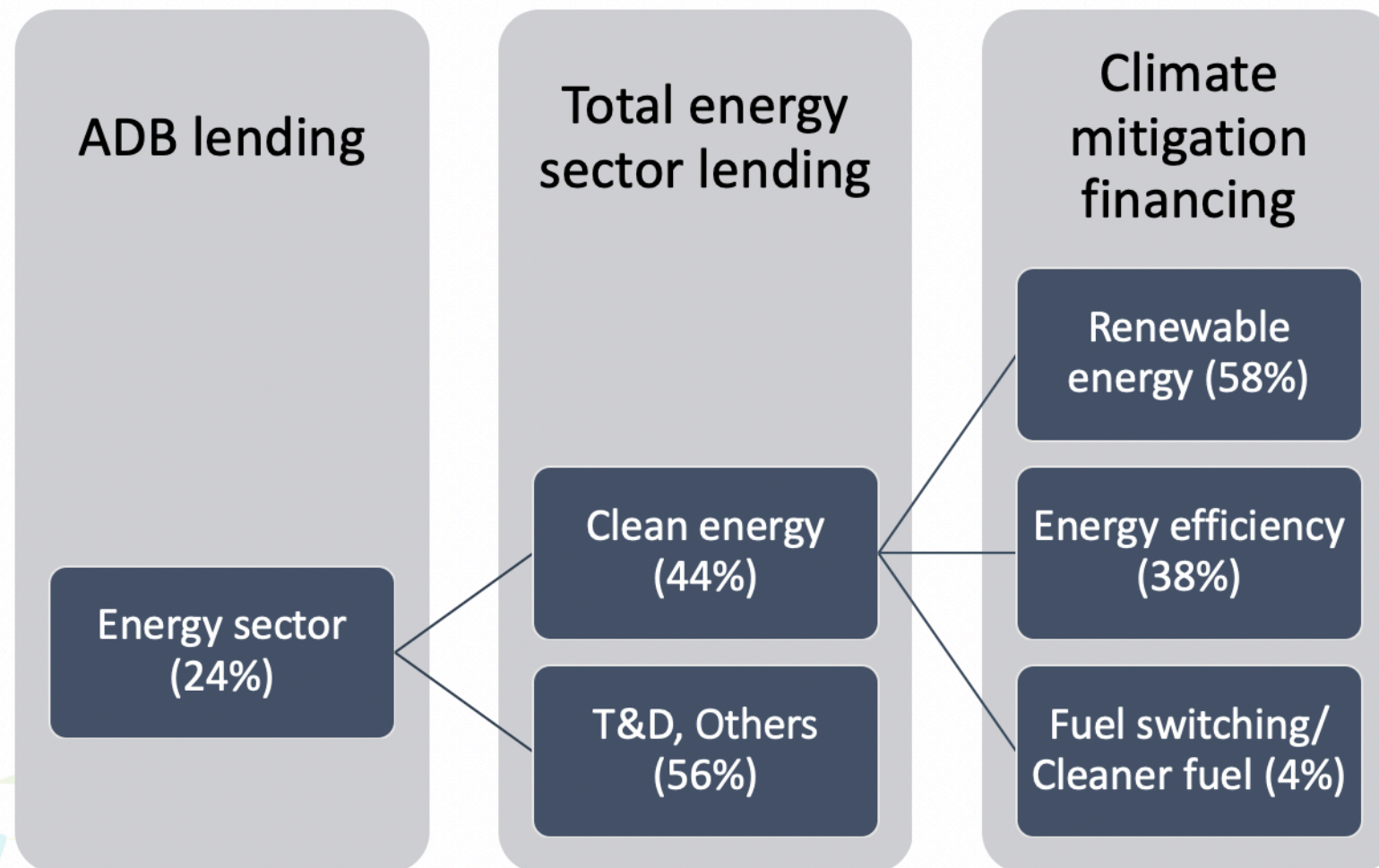
Creating and enabling
regulatory framework
for effective
markets/sector
development

SDG 7
(Universal Energy
Access)

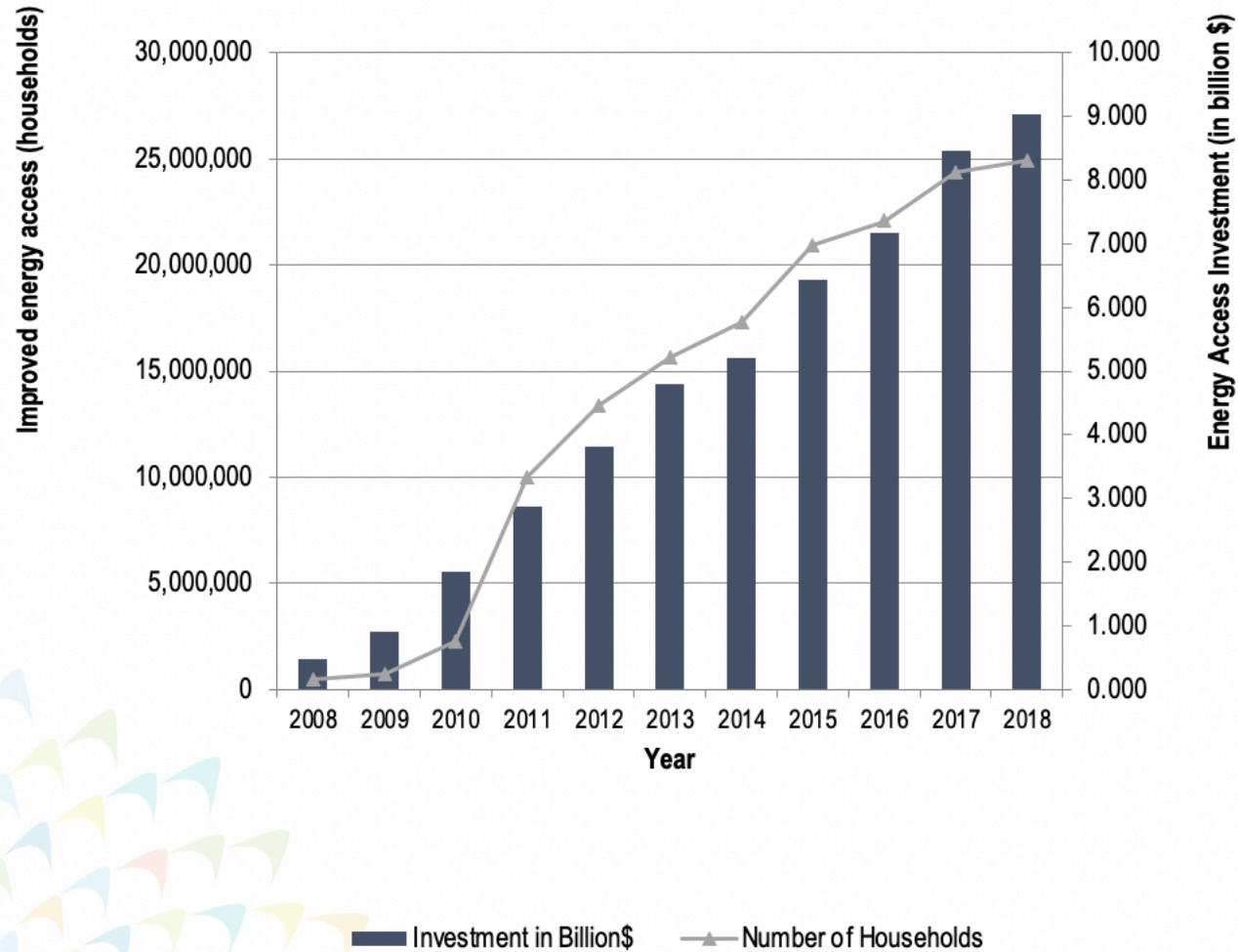
Global Climate
Goals/NDCs

ADB Strategy
2030
(7 Operational
Priorities)

Energy sector lending, 2009-2018 (annual average share, in %)



Operations Outcome: Progress in Energy Access



- **\$ 9.0 billion** total ADB investments in energy access from 2008 to 2018
- **24 million** households cumulative provided with energy access (electricity, clean cooking) from these investments

Operations Outcome: Progress in Clean Energy

ADB

Indicator	Unit	2011	2012	2013	2014	2015	2016	2017	2018
Additional RE capacity installed	GW	0.87	2.46	1.39	2.06	0.62	2.06	1.56	0.58
CO₂ emission reduction	million tons/ year-equivalent	13.68	15.98	7.06	9.00	21.85	13.49	11.78	10.7
Electricity savings	<u>TWh/</u> year	3.29	0.87	1.99	0.07	4.48	4.69	0.74	3.98
RE electricity generation	<u>TWh/</u> year	3.30	4.91	5.22	5.93	1.48	4.62	4.80	2.38

Energy Sector Lending in 2018

- Total approvals in the Energy Sector in 2018 amounted to **\$3.93 billion** including **\$1.23 billion** from PSOD (31% of total energy sector lending)
- Total climate mitigation finance approved in the sector in 2018 amounted **\$1.42 billion** including **\$0.48 billion** from PSOD (or 34% of the total climate financing)
- Transmission and distribution projects without energy efficiency improvement and greenfield natural gas projects are usually not considered as climate financing.

Amount	CWRD	EARD	PARD	PSOD	SARD	SERD	Total
Total	958.42	439.91	25.00	1,233.47	975.00	298.90	3,930.70
Climate Finance	192.80 (20%)	427.00 (97%)	4.60 (18%)	476.67 (39%)	254.13 (26%)	101.00 (34%)	1,456.20 (37%)
- Mitigation	187.40 (97%)	427.00 (100%)	2.43 (53%)	476.67 (100%)	224.48 (88%)	101.00 (100%)	1,418.98 (97%)
- Adaptation	5.40 (3%)	0.0	2.17 (47%)	0.0	29.65 (12%)	0.0	37.22 (3%)
T & D, Others	765.62 (80%)	12.91 (3%)	20.40 (82%)	756.80 (61%)	667.24 (74%)	197.90 (66%)	2,505.27 (63%)

Trends in Clean Energy Investments

- ADB investment in clean energy averages \$2.1 billion 2008 – 2018, exceeding the target of \$ 2 billion/year
- Clean energy finance fell from \$2.0 billion in 2017 to \$1.42 billion in 2018, due to:

Globally:

- declining cost of renewable energy (solar, wind) vs. technical limits on additional renewable energy capacity
- reduced subsidies (most countries have stopped feed-in-tariff), thus higher market risk – learning curve for investors

MDBs:

- as renewable energy markets mature, commercial banks more active in providing funding

ADB:

- increasing support to distributed energy systems (rooftop solar, mini-grids etc.) that are smaller in size
- there have also been gradually declining opportunities for supply side energy efficiency improvements in system loss reduction and gas-based power generation

Energy Sector Operations Going Forward

Projected sovereign operations 2019-2021

- Transmission and distribution projects: **44%** ; Energy sector development and institutional building: **16%** ; Renewable energy: **24%** ; Energy efficiency: **11%** ; Others (e.g. gas power): **5%**
- Climate financing: **\$1.2 billion/year** during 2019-2021

More effort to contribute to S2030 climate financing target

- Expand **demand side** energy efficiency projects, requiring new business models
- Increase **cross sectoral projects** (finance, urban, transport, water, agriculture etc.) requiring new financing instruments; integrated approach, e.g. **low carbon cities**

Enhancing methodology of counting climate financing

- Continue to support **transmission projects** to integrate more renewable energy (so far mostly not counted as climate financing given the current MDB methodology)



PRC: Air Quality Improvement in the Greater Beijing-Tianjin-Hebei Region - Henan Cleaner Fuel Investment Program

- Sovereign operations
- Subsectors: Energy Efficiency; Renewable Energy - Biomass
- Approval by Q4 2019
- Results-based loan
- \$300 million (OCR)
- **Issues:** Henan province is one of the major air pollutant emitters in the Greater Beijing-Tianjin-Hebei Region and highly dependent on coal. Gas supply has increased significantly in cities, but semi-urban and rural areas remain unserved due to high capital cost of connecting scattered population with low demand size, and persistence in use of traditional energy sources.
- **Approach:** Facilitate fuel switch from coal to natural gas and biogas in industrial, commercial, and household energy use in semi-urban and rural areas of Henan.
- **Design/Innovative Solution:** Proposed program adopts the **result-based lending (RBL)** modality to support cleaner fuel switch by
 - i. Developing the gas distribution system
 - ii. **Pilot piped biogas production facility** – proposed technology dry anaerobic fermentation
 - iii. Awareness campaign on use of cleaner fuel – behavior change of rural population
 - iv. Public private collaboration - institutional capacity enhancement for sustainable program implementation and mobilizing local commercial co-financing (China Development Bank \$200 million).



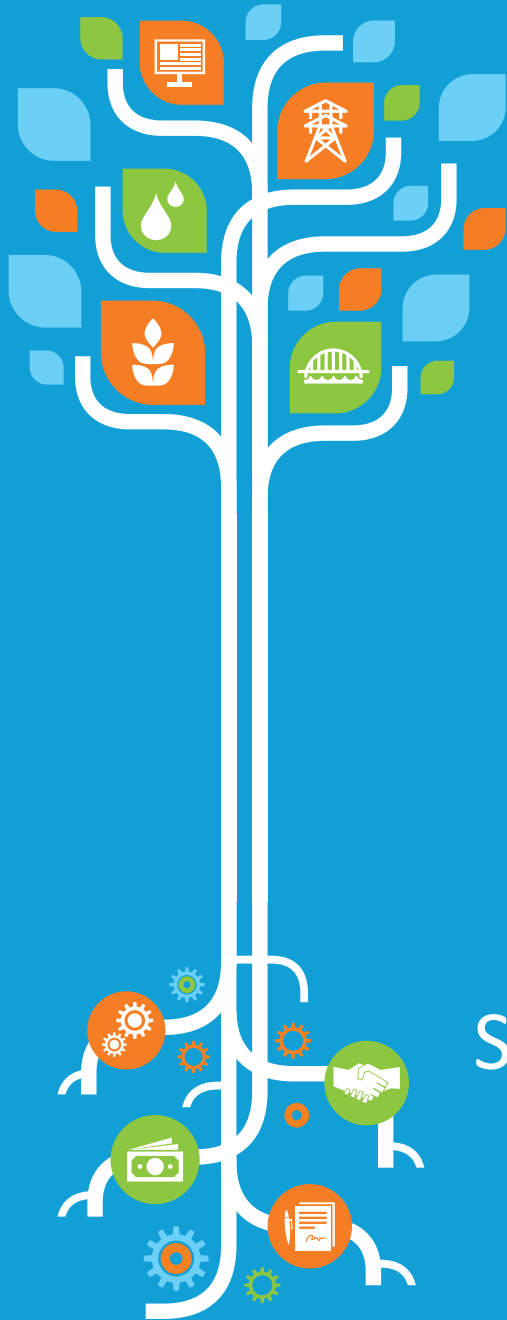
TON: Renewable Energy Project

- Sovereign operations
- Subsector: Electricity Transmission & Distribution
- Approved on 11 March 2019
- \$12.2 million project loan (ADF)
- Green Climate Fund grant co-financing: \$29.9 million
- Government of Australia grant: \$2.5 million
- **Issues:** multiple challenges (climate change, energy insecurity and high electricity cost, and low energy access rate)
- **Approach:** assist Tonga generate more than 50% renewable energy by 2020 and 70% by 2030. The project will create technically enabling environment for IPPs: a 6 MW solar PV of IPP transaction is being finalized (PSDI provided transaction advisory services, and PSOD is considering to co-finance the transaction under Pacific Renewable Energy Program approved in 2019)
- **Design/Innovative Solution:**
 - The project is under Pacific Renewable Energy Investment Facility (approved in 2017)
 - **A large battery energy storage system capacity in the main island to store intermittent electricity renewable energy**
 - Solar PV, hybrid system, and grid technologies and management upgrade in the outer islands
 - Effective gender mainstreaming



AFG: Kandahar Solar Power Project

- Non-sovereign operations
- Subsector: Renewable energy - Solar
- Approved on 2 April 2019/
Signed on 17 May 2019
- \$4.0 million LIBOR-based loan (OCR)
- Canadian Climate Fund for Private Sector in Asia-II: \$3.85 million
- **Issues:**
 - AFG ranks amongst lowest 5% per capita electricity consumption (100 kWh compared to global average of 3,125 kWh).
 - Total installed generation capacity of 568 MW falls far short of required demand. Chronic power shortage.
 - Significant import dependence (80% of power and 97% of fuel); major implications for scarce FX reserves.
 - Non-availability of long-term financing to support any infrastructure due to heightened country risk.
- **Approach/Innovative Solution:**
 - Identify a credible sponsor (with established track record and experience in Afghanistan)
 - **Crowd in a blended finance package (innovative combination of long-term loans and concessional financing) to ensure commercial viability and meet entire financing requirement**
 - Set precedent for private sector grid-connected solar sector by supporting the first, highly demonstrational solar power plant
 - Fully consistent with objective to support FCAS countries by providing essential infrastructure.
- **Design/Specifications:**
 - 15.1 MW solar power project; 6 KM transmission line upgradation; equipment procured from highly reputed suppliers; 20-year PPA with DABS
 - Generates 27.5 gigawatt-hours per year; Annual CO2 emission avoidance of 8,500 tons



THANK YOU!

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Department

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