Climate change considerations for PPP development

22 October 2024

Ichiro Aoki, Principal Markets Development Advisory Specialist, ADB

Gerrit Held, Climate Change Specialist, ADB

ADB

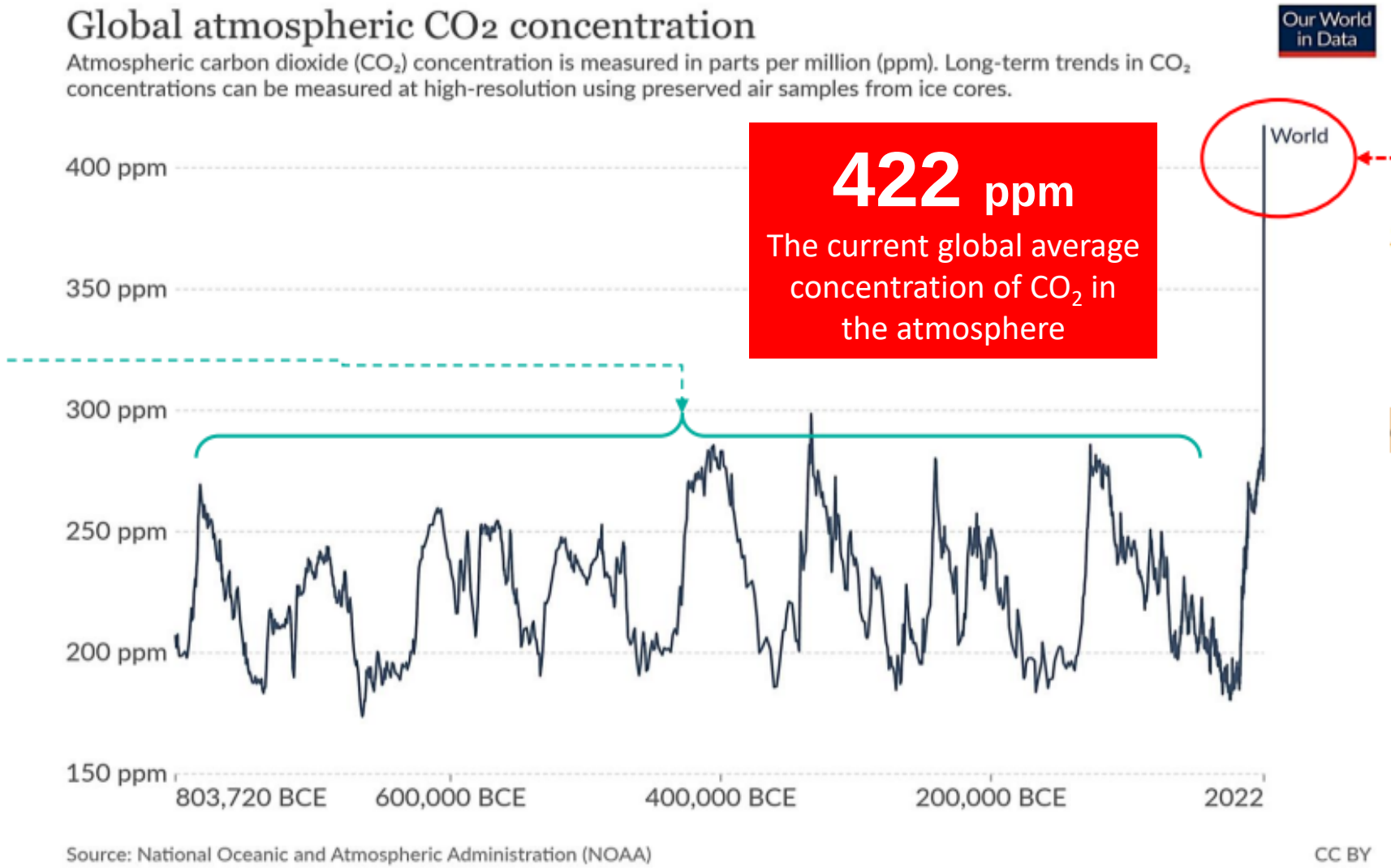
Session agenda

15:50 – 16:00	Climate Change: A quick recap…
16:10 – 16:25	ADB's response as Asia and the Pacific's Climate Bank
16:25 – 16:50	Implications for the design and delivery of PPPs
16:50 – 17:05	Case Studies
17:05 – 17:20	Q&A

A quick recap…

What are we trying to solve?

Atmospheric concentrations of CO_2, the main agent of global warming, were **relatively stable** for at least c.1 million years.



422 ppm

The current global average concentration of CO_2 in the atmosphere

Since the Industrial Revolution they have **roughly doubled**.

Why does it matter for Asia and the Pacific?

Impacts from disasters in Asia and the Pacific are already very real* (2015-2023)

851.6 million
People affected

42,905
Fatalities

446.3 billion
Total losses

Total losses for ADB DMCs only

2015

PHILIPPINES
Typhoon Chan-hom (Jul)
$1.9 billion
(5 deaths)

VIET NAM
Drought (Dec-Feb 2017)
8.3 billion
(1.8 million affected)

PRC
Typhoon Mujigae (Oct)
$5.2 billion
(20 deaths; 78,300 affected)

VANUATU
Cyclone Pam (Mar)
$0.55 billion
(188,000 affected)

$48.9 billion

2016

PRC
Flood (Jun-Jul)
$26.8 billion
(289 deaths; 60 million affected)

SRI LANKA
Flood (May)
$1.5 billion
(203 deaths)

INDIA
Cyclone Vardah (Dec)
$1.2 billion
(24 deaths)

FIJI
Cyclone Winston (Feb)
$0.73 billion
(540,558 affected)

$63.1 billion

2017

PRC
Flood (Jun-Jul)
$7.2 billion
(78 deaths)

PRC
Typhoon Hato (Aug)
$4.2 billion
(8 deaths)

THAILAND
Flood (Jan)
$1.2 billion
(96 deaths)

$30.4 billion

2018

INDIA
Flood (Aug)
$3.3 billion
(504 deaths)

PRC
Tropical storm Rumbia (Aug)
$6.3 billion
(53 deaths)

PRC
Flood (May-Jul)
$2.0 billion
(112 deaths)

$26.3 billion

2019

INDIA
Flood (Jul-Sep)
$11.4 billion
(1,900 deaths)

PRC
Cyclone Hanna (Jul-Sep)
$11.4 billion
(72 deaths)

INDONESIA
Flood (Dec)
$1.4 billion
(66 deaths)

$36.6 billion

2020

PRC
Flood (May-Jul)
$19.2 billion
(280 deaths)

INDIA
Cyclone Amphan (May)
$15.3 billion
(90 deaths)

INDIA
Floods, Landslides (June)
$8.5 billion
(1,922 deaths)

PAKISTAN
Flood (Aug-Sep)
$1.7 billion
(410 deaths)

TONGA
Cyclone Harold (Apr)
$0.13 billion
(25,00 affected)

$65.1 billion

2021

PRC
Flood (Cyclone Cempaka) (Jun-Aug)
$17.8 billion
(352 deaths)

PRC
Drought (Jan-Dec)
$3.3 billion

INDIA
Cyclone Yaas (May)
$3.2 billion
(19 deaths)

$39.3 billion

2022

PRC
Drought (Jul-Aug)
$7.6 billion
(6.1 million affected)

INDIA
Flood (May-Oct)
$4.2 billion
(2,035 deaths; 1.3 million affected)

PAKISTAN
Flood (Jun-Sep)
$10 billion reconstruction cost
(1,739 deaths; 33 million affected)

$18.5 billion

2023

MYA
Cyclone Mocha (May)
$2.2 billion
(145 deaths, 0.9 million affected)

PRC
Floods (May)
$0.08 billion
(0.5 million affected)

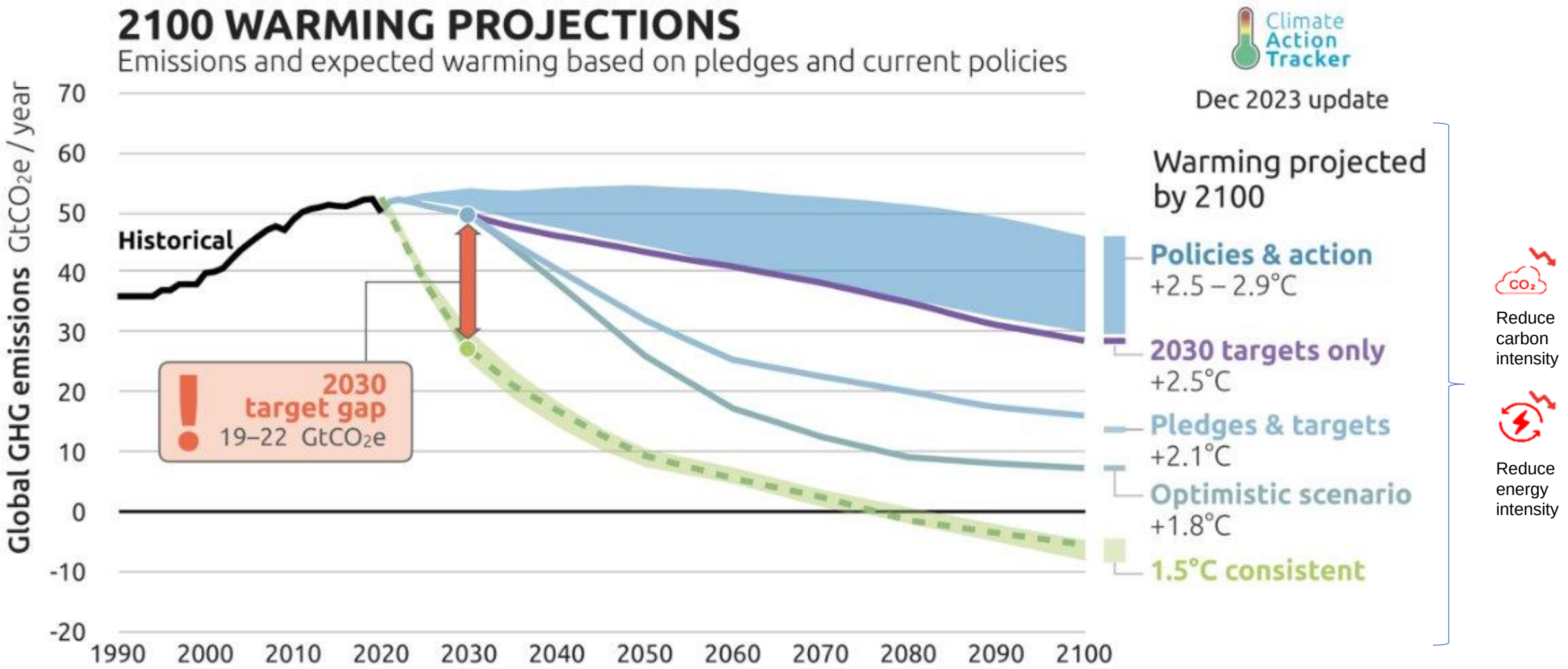
PHI
Cyclone Doksuri (July)
$0.11 billion
(45 deaths, 2.5 million affected)

$2.5 billion

Notes:
1. The amounts for total losses 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)
2. Source: EMDAT, accessed 5 Feb 2024. Annual data validation currently being performed for 2023 EMDAT data

Photos: CTTO

Where do we need to go?



What role does infrastructure play?

Infrastructure systems have direct influence on about 80% of all greenhouse gas (GHG) emissions globally, with most associated with energy, buildings and transport. We can't tackle climate unless we climate-proof the infrastructure of tomorrow.

Figure 2: Infrastructure sector contribution to total GHG emissions.[14,15,16]

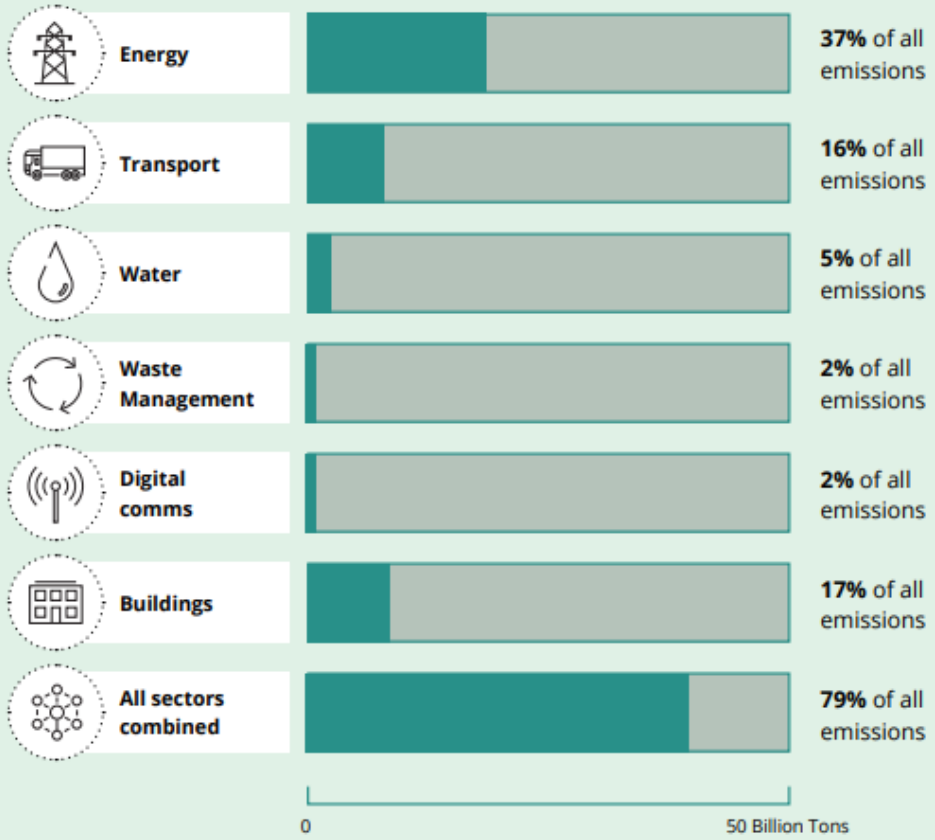
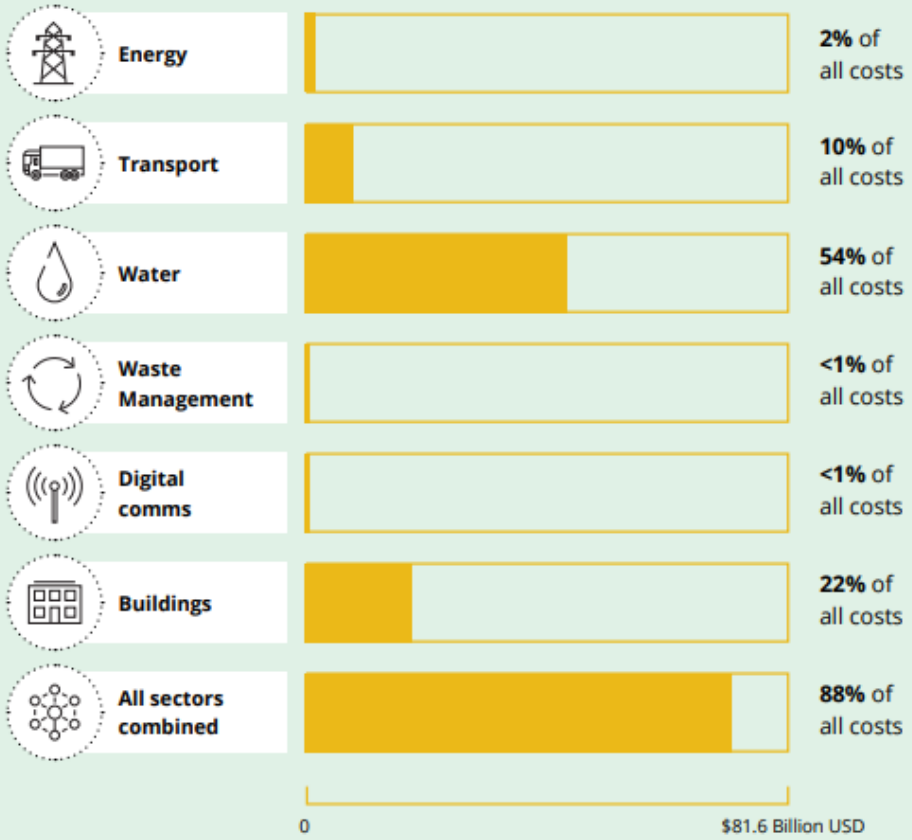


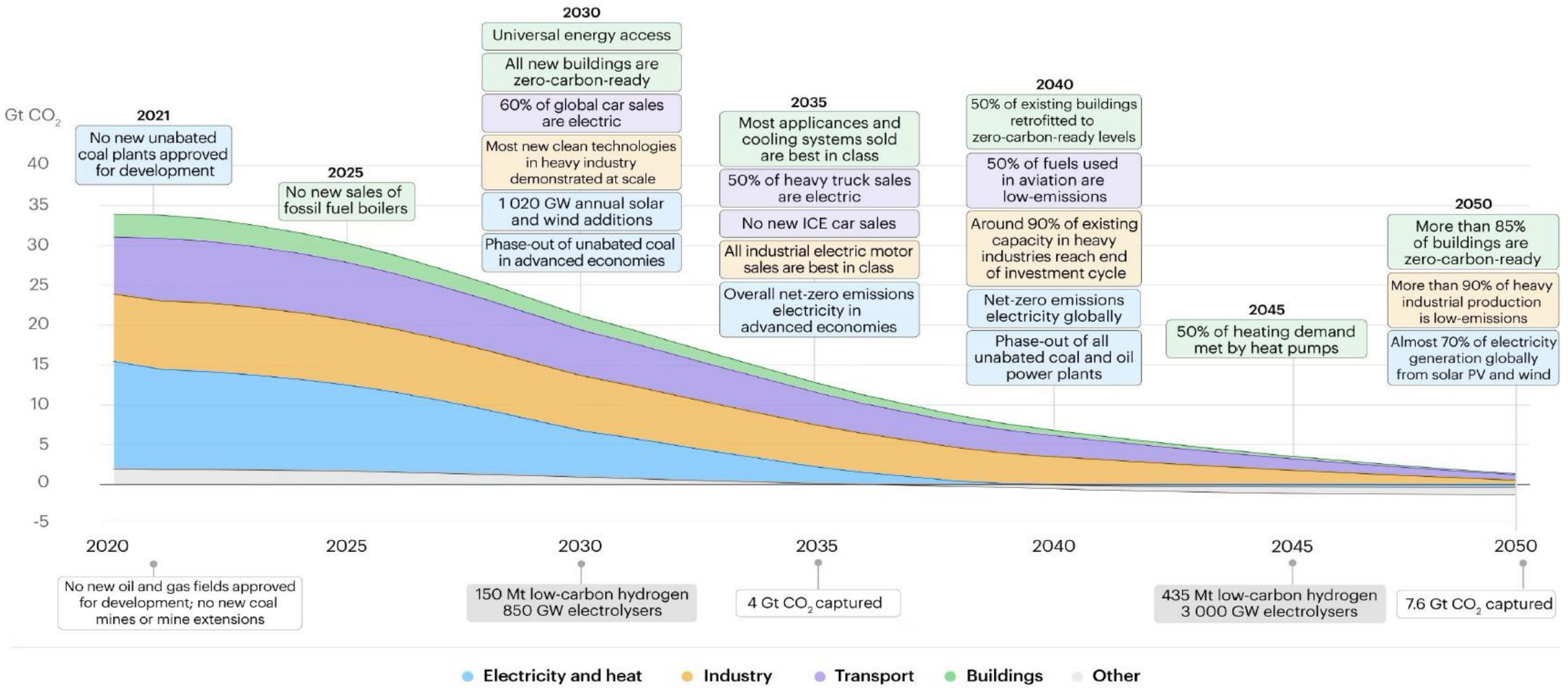
Figure 3: Infrastructure sector share of global climate adaptation costs (2010-50 estimates).[19]



Source: UNEP, Infrastructure for climate action (2021)

What are key priority actions to guide the global journey to net zero?

Key milestones on pathway to net zero (IEA, Net Zero by 2050)

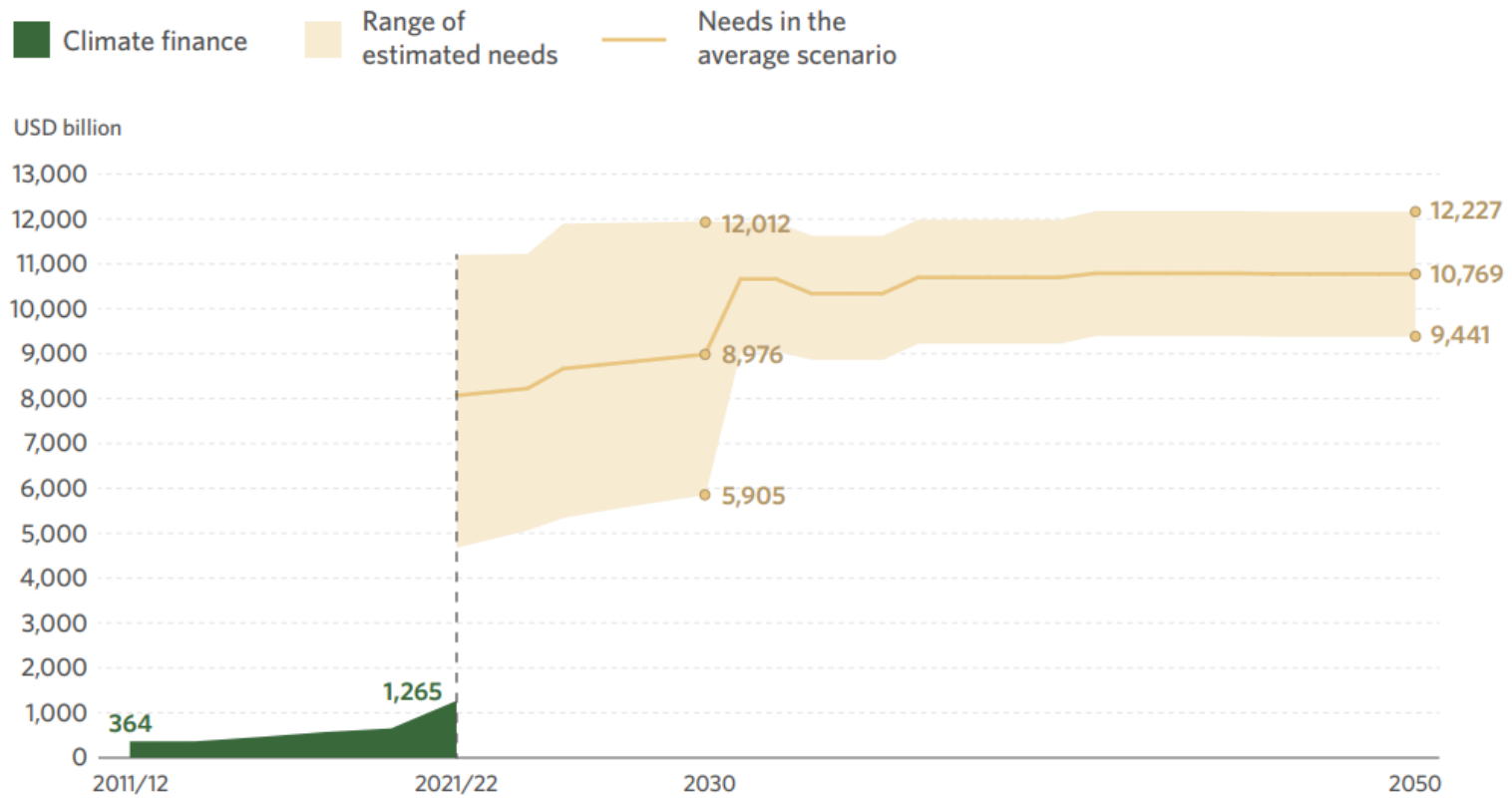


Source: IEA, https://www.iea.org/reports/net-zero-by-2050

PPPs will be crucial to advance sustainable infrastructure development

- The public sector alone will not be able to fill the climate investment gap without mobilizing private capital;
- As demand for fundamental and essential infrastructure remains high in Asia, PPPs will be instrumental to generate the supply of investable projects.
- If structured correctly, PPPs can increase climate resilience and incentive green investment opportunities.
- PPPs are able to provide well informed and well-balanced risk allocation between partners— offering long-term visibility and stability for the duration of a contract

Global tracked climate finance and average estimated annual needs through 2050



Note: Climate finance needs estimates for 2023-2050 include direct investments in climate-specific physical assets and excludes transition-related unabated fossil fuel finance. Estimates are based on secondary data collected from over 15 sectoral scenarios (see Methodology document for detail). Climate finance needs for 2023-2050 are expressed in 2022 USD to ensure comparability of estimates from several different scenarios.

Source: Global Landscape of Climate finance 2023 CPI

ADB’s response…

ADB to step up its support as Asia and the Pacific's Climate Bank

ADB has initiated a major reform to become the Climate Bank of Asia and the Pacific

- $100 billion climate finance ambition (2019-2030)
- Alignment with the Paris Agreement
- Developing a pipeline of high-quality climate projects and programs focused on climate outcomes

ADB will scale up its impact by catalyzing high-quality climate action through external finance

- Multiply its own funds by catalyzing climate finance from the private sector and other sources
- Drive innovation in climate finance through cutting-edge initiatives, e.g., IF-CAP, ETM, the Climate Action Catalyst Fund, and innovative nonsovereign operations projects

ADB will continue to incentivize innovation in climate action with its own work and through partners

- Lead sector, thematic, and interdisciplinary innovation across the region, provide finance for new ideas, apply new technologies, and build partnerships
- Develop thematic hubs able to leverage knowledge, adapt technology, and mobilize foreign direct investment and local resources to maximize climate impact

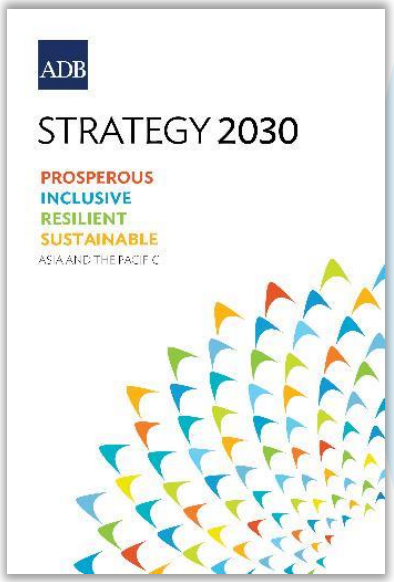
ADB's new operating model enables more effective work across regions, sectors, and themes to deliver multidisciplinary solutions to sovereign and private sector clients

- Combine upstream policy and diagnostics to inform specific pathways and investments downstream
- One ADB teams to ensure the best technical, financial, operational, and knowledge solutions

Climate related advisory services now a core part of ADB's strategy

Updated mid-term review
five strategic focus areas

Strategy 2030



- **Climate action**
- **Private sector development**
- **Regional cooperation and public goods**
- **Digital transformation**
- **Resilience and empowerment**

ADB's New Operating Model (NOM)

SHIFT Climate change → SHIFT Private Sector development → SHIFT Solutions → SHIFT New ways of working

NOM Shifts

Corporate Results Framework includes climate related indicators

Guided by ADB's Climate Change Action Plan 2021-2030

Safeguard Policy | Energy Policy | Disaster and Emergency Assistance Policy ... among others.

Climate Change Action Plan, 2023-2030

Guiding Principles

- Client-centric
- Bottom-up and iterative
- High impact
- Private Sector participation
- Evidence-based
- Integrated solutions
- Just Transition

Setting the scene

- Global and regional context
- ADB's climate ambitions and commitments
- CCAP objectives

How we operate

- Partnerships
- Climate investment and impact
- Knowledge

How we engage

- Upstream
- Midstream
- Downstream

How we deliver

- Integrated climate-smart planning and technology
- Inclusive and climate-smart socioeconomic development
- Climate-smart Infrastructure
- Biodiversity, agrifood systems, nature-based climate solutions
- Green and blue finance

How we improve

- Arrangements
- Monitoring

List of actions

Sector-specific actions

For more:
Five Things to Know About ADB's Climate Change Action Plan

SCAN TO DOWNLOAD THE REPORT

How we engage

Strengthened support for DMC's climate actions

1 Support DMCs with increased diagnostic and policy engagement work

2 Help DMCs develop climate-responsive investments and ambitious NDCs and NAPs

3 Integrate climate policy into budgets and national plans

4 Developing low carbon and climate resilient project pipelines

5 Enhance climate-informed project design and implementation

Monitoring and Learning

UPSTREAM
Strategic engagement for an enhanced policy framework, including for private sector engagement

MIDSTREAM
Mobilize the private sector and embed climate action into core institutions and national systems

DOWNSTREAM
High-quality operations and implementation. project preparation facilities and implementation support

How we deliver

Integrated low-carbon & climate-resilient operations

Themes

- Digital technology for development
- Gender equality
- Regional cooperation and integration, trade
- Transition states and engagement

INTERVENTION AREAS FOR CLIMATE ACTION

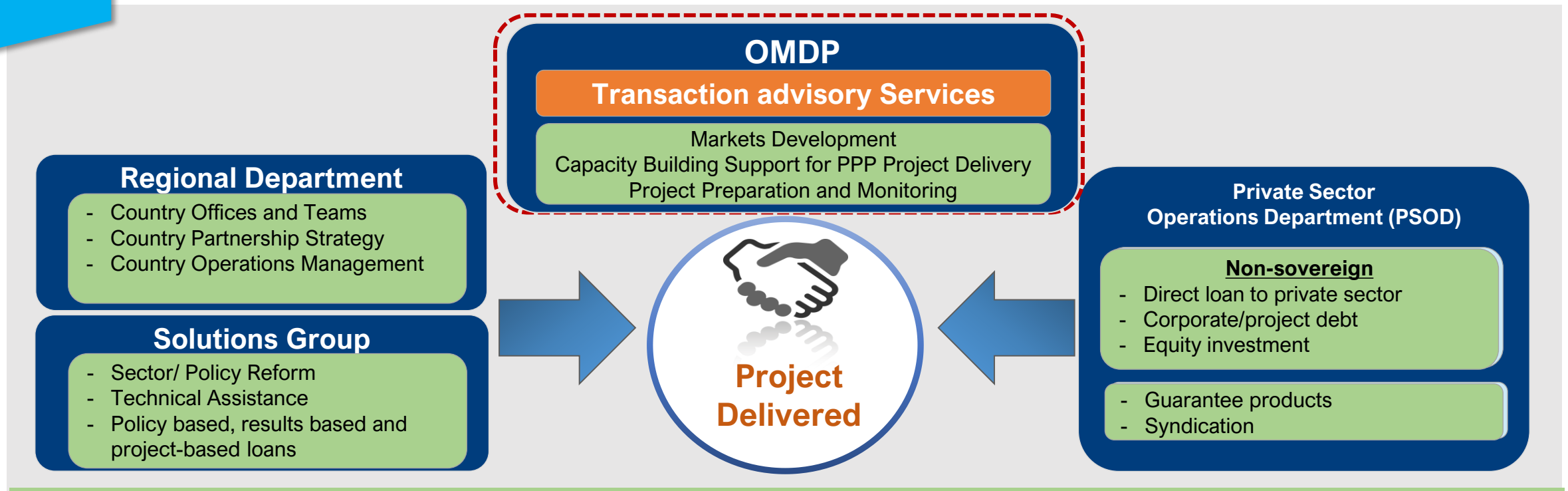
- Integrated climate-smart planning and technology
- Inclusive and climate-smart socioeconomic development
- Climate-smart infrastructure
- Biodiversity, agrifood systems, nature-based climate solutions
- Green and Blue Finance

Sectors

- Agriculture, Food, Nature, and Rural Development
- Energy
- Public Sector Management and Governance
- Finance
- Transport
- Human and Social Development
- Water and Urban Development

How we operate

ADB support to deliver sustainable infrastructure

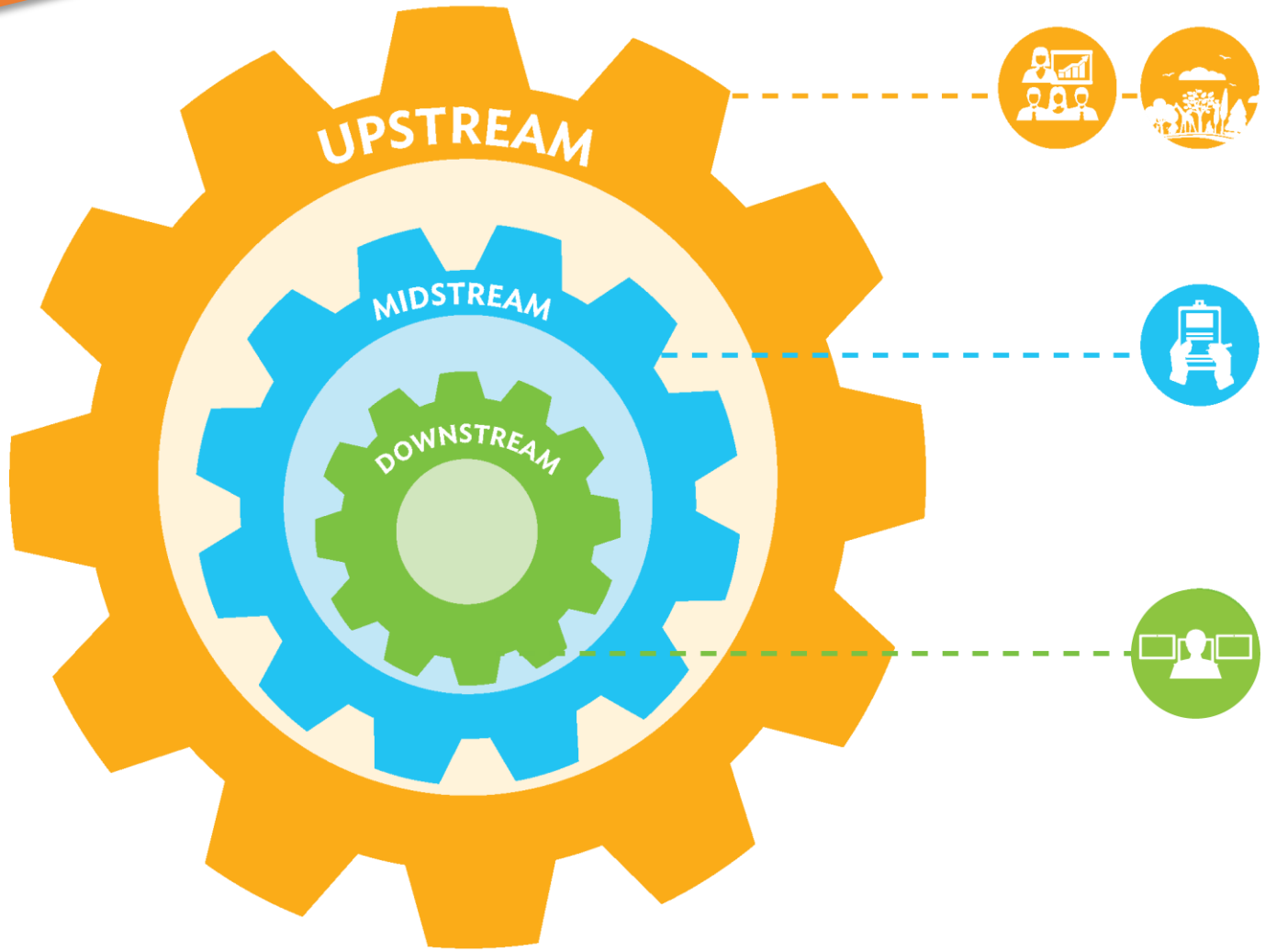


One ADB Approach –

- **OMDP**: For development of PPP projects, OMDP carry out project selection activity, feasibility study, drafting of concession agreement, etc. For select projects and upon request of government and private sector, OMDP advises the client on bankability issues, tender and financial closing.
- **Sovereign (Solutions Group and Regional Department)**: Provides government and government-owned entities technical assistance for capacity building, sector and policy reforms and loans under various modalities. Based on counter-indemnity of sovereign, lends to a project or implementation agency.
- **PSOD**: As a non-sovereign lending arm of ADB, PSOD finances PPP project through project and/or corporate loan and invests in equity for qualified projects. PSOD also provides political risk and credit enhancement guarantees and offer syndication services.

OMDP

Advisory services provided to government agencies



Upstream

Capacity Building
Enabling Environment

Raise awareness, enhance governmental entities capacity, establish policies and frameworks, identify potential projects, and provide support to facilitate PPP development

Midstream

Project Preparation and TAS

Assist in designing and preparing bankable PPP projects through **transaction advisory services** and continuously share knowledge sharing and support to enhance the enabling environment for private sector investment

Downstream

Project Monitoring

Provide post-commercial close support for contract management and project monitoring to ensure successful implementation of the PPP projects we advise.

Implications for the design and delivery of PPPs

Climate risks in the context of PPPs (Physical risks)

	Chronic risks	Acute risks			
	Sea level rise	Temperature rise	Drought**/Heatwave	Storm/Flood	Wildfire
Energy	● Inundation of assets	○ Coolant losses ● Hydropower output reduction ● Transmission and distribution efficiency loss ● Distribution network failure		● Network outages ● or failure	● Damage to assets (erosion or breakage)
Telecoms		○ Coolant losses			● Network outages ● or failure
Transport		● Melting/ buckling of roads/rail	● Melting/buckling of roads/rail ● Water-based traffic disruptions	● Traffic disruptions	● Traffic disruptions
Water and sewage networks	● Inundation of assets ○ Increased desalination requirements ○ Increased water storage requirements	○ Increased need for treatment ● Water source shortage		○ Increased need for treatment ○ Liabilities or fines for overflows	○ Increased need for treatment ● Water source shortage

Impacts: ● Physical damage ● Efficiency/output loss ○ Maintenance cost increase

1 This table focuses on the direct impacts of each risk type, and therefore do not include the indirect effects chronic risks can have on acute risks.
2 A drought can manifest as a chronic risk in the form of a multiple-season or multiple-year drought or a permanent change in water availability.

Defining Transition Risk in the Context of Net-Zero

Policy and Regulatory Changes

Changes in government policies, such as carbon pricing, emissions reduction mandates, or bans on certain fossil fuels, can create uncertainty and financial risk for infrastructure assets reliant on high-carbon activities.

Technological Shifts

Rapid advancements in clean technologies may render existing technologies obsolete, impacting infra and workers reliant on older, carbon-intensive technologies.

Market demand changes

Shifts in consumer preferences toward sustainable products and services can decrease demand for carbon-intensive goods, impacting revenues for businesses that fail to adapt e.g. preference for rail over air travel

Reputational Risks

Companies may face reputational damage if perceived as lagging in sustainability efforts, affecting investor confidence and customer loyalty.

Financial Risks

Transition risks can lead to significant financial risks for companies and investors. These include potential asset devaluations and increased costs of capital for firms perceived to have higher exposure to carbon-intensive activities. This can lead to increased volatility and potential losses for investors.

Operational Risks

Infrastructure assets may face significant challenges that could disrupt day-to-day operations during the transition. These include stranded assets, supply chain disruptions, and workforce changes.

Measures to address physical and transition risks

Climate adaptation

Adjust systems in response to changing climate

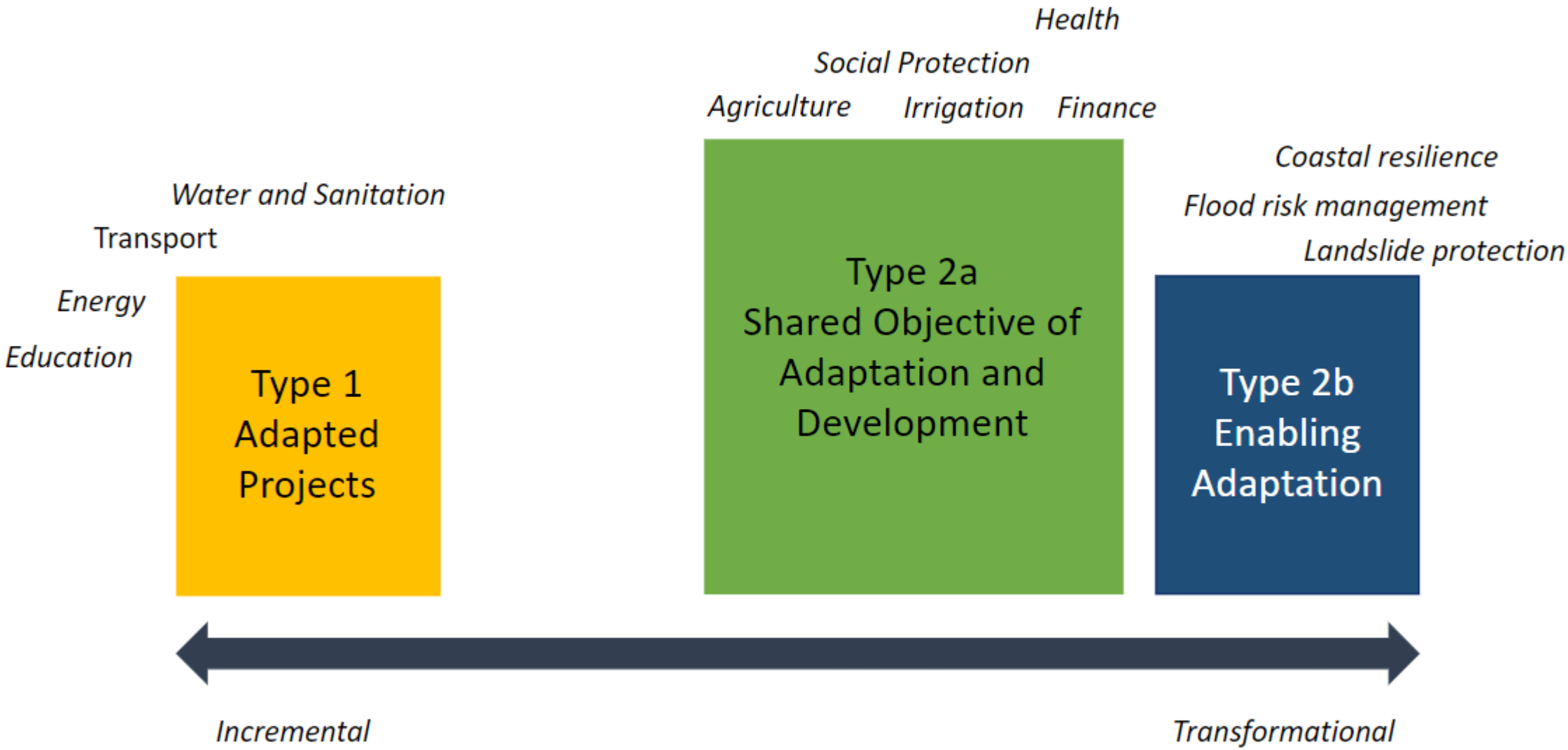
- Develop projects with climate risks like floods, landslides and droughts in mind
- Make processes more resilient
- …

Climate mitigation

Cut emissions and slow the pace of climate change

- Build out renewable energy
- Make processes more efficient
- Substitute fossil feedstocks
- …

Typology of climate adaptation projects (ADB definition)



Typology of climate mitigation projects (J-MDB definition)

Energy: Renewables, low carbon hydrogen, waste gas to energy, co-/ trigeneration, carbon capture, storage, transmission

Water Supply and Wastewater: energy & resource efficiency, Demand management, low-carbon water supply, wastewater management

ICT and Digital Technologies: energy efficiency and renewable energy in data centers and telecom networks e.g. green data centers

Mining : critical minerals, ores, metals and alloys used for renewable energy, energy efficiency, and low carbon technologies and materials

Solid Waste Management: waste collection and transport, product reuse, material recovery, anerobic digestion, composting, waste incineration with energy recovery, landfill gas capture & utilization

Manufacturing: EE, resource efficiency, electrification, carbon capture, industrial gases, resource demand management, energy storage, Circular Economy, (low carbon) product innovation

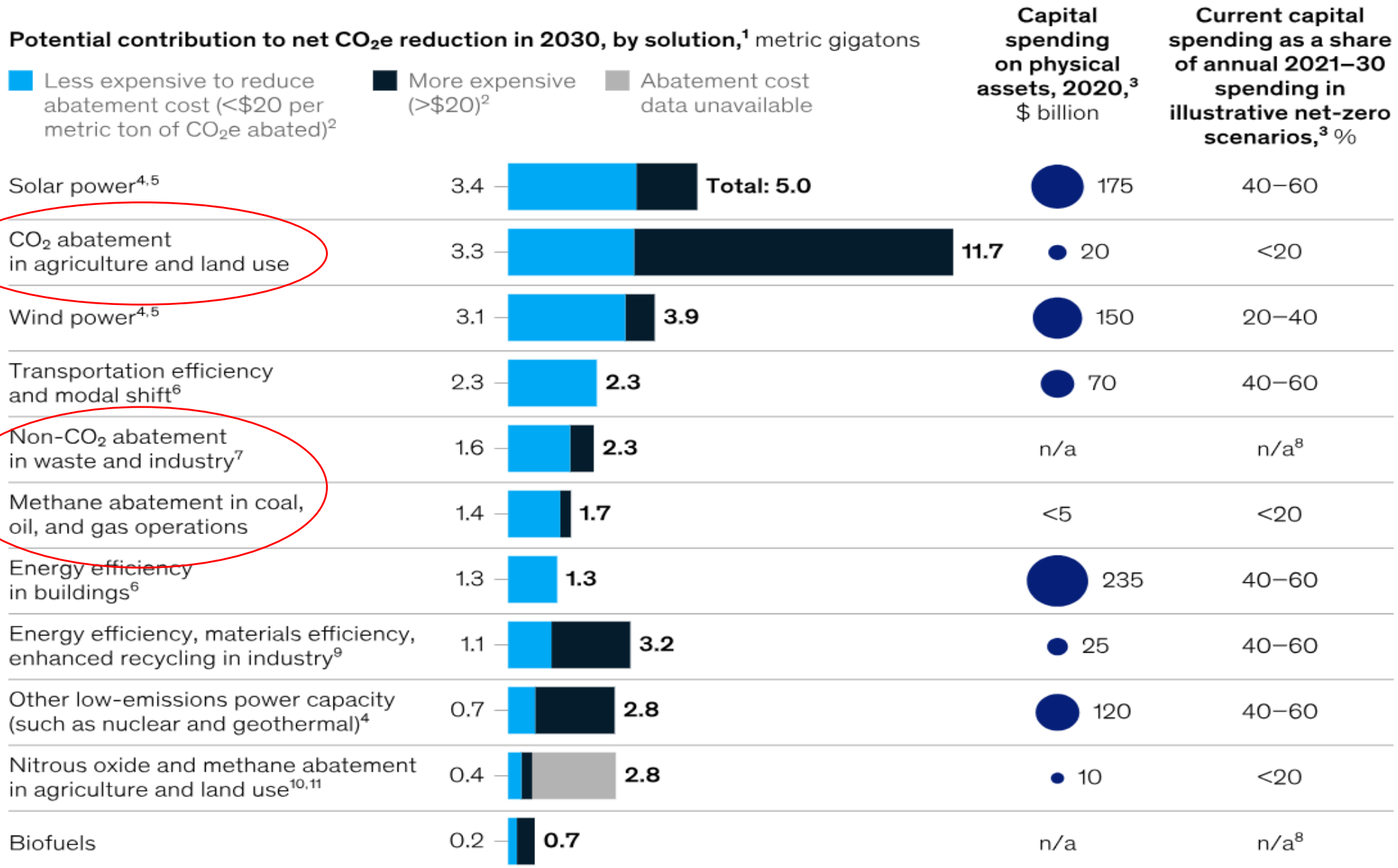
Transport: modal shift, non-motorized transport, inter-urban railway, mass transit, water transport, low carbon vehicles & Infrastructure (EV charging), transport demand management

Agriculture, Forestry, Land Use, and Fisheries: Climate-smart agriculture, sustainable forest management, carbon sequestration, regenerative agriculture, better waste management, improved breeds, reduced food losses

Buildings and Public Installations: certified green buildings, energy efficiency, onsite renewable energy, energy management systems e.g. green Hospitals

Cross-Sectoral Activities: Energy and resource-use efficiency across a supply chain, demand reduction, electronic service delivery, energy transition, CCS

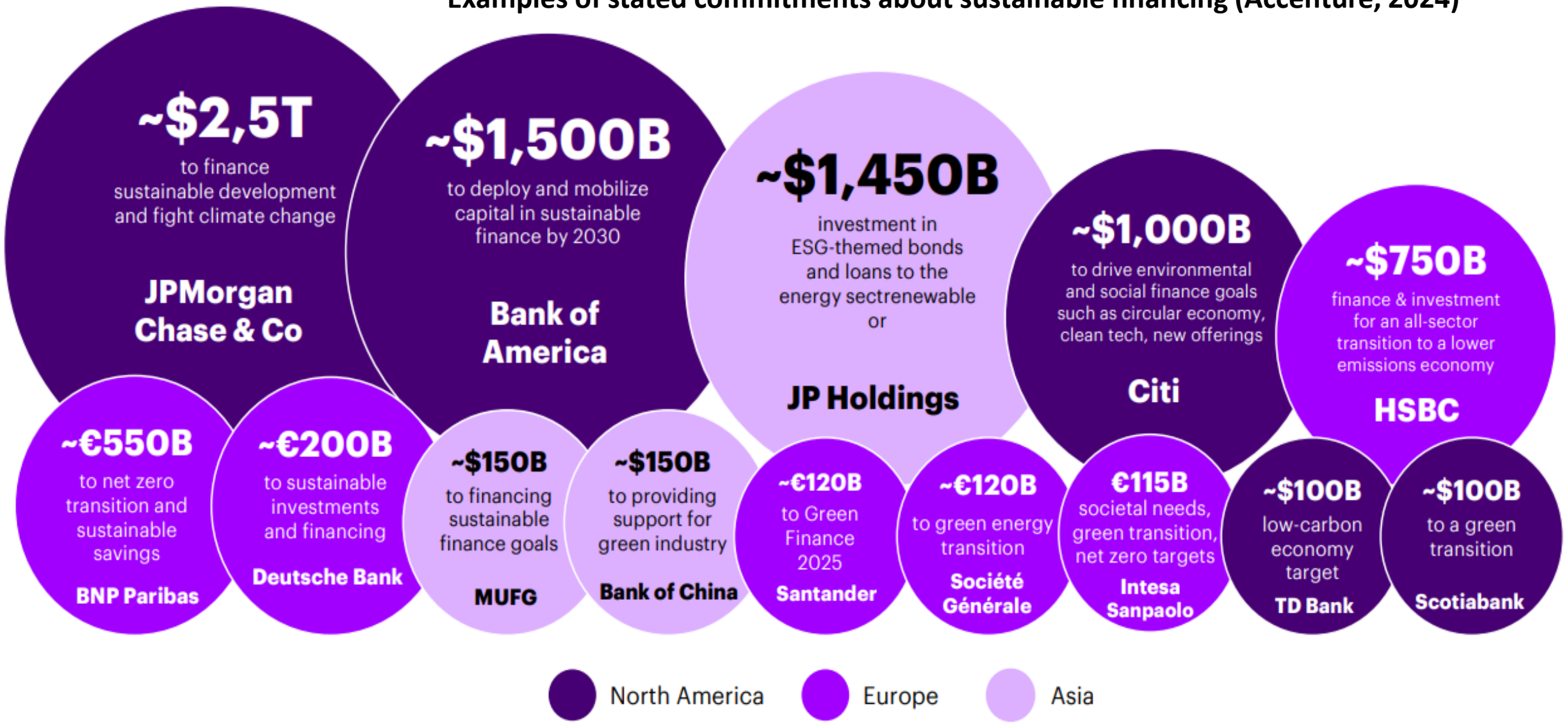
Mitigation solutions that are relatively low cost (Illustrative)



Source: McKinsey, An affordable, reliable, competitive path to net zero (2023)

Access to finance increasingly subject to climate change considerations

Examples of stated commitments about sustainable financing (Accenture, 2024)



MDB finance for PPPs is conditional upon Paris Alignment

ADB

AFRICAN DEVELOPMENT BANK GROUP | ADB | AIIB ASIAN INFRASTRUCTURE INVESTMENT BANK | CEB COUNCIL OF EUROPE DEVELOPMENT BANK | European Bank for Reconstruction and Development | European Investment Bank The EU bank | IDB | IsDB البنك الإسلامي للتنمية Islamic Development Bank | New Development Bank | WORLD BANK GROUP

STEP 01

Assess consistency with the Country's Climate Strategies as described in the NDC, LTS, NAPs etc. If available, advice sector-specific documentation.

STEP 02

Identify the Risks associated with project-specific adaptation, resilience and mitigation goals

A. ADAPTATION / RESILIENCE GOALS

Are risks from climate hazards likely to negatively impact the project, its operations and its objectives ?

YES → NOT ALIGNED

B. MITIGATION GOALS

- Does the project achieve the Development Objective(s) with low GHG emissions
- Does the project account for transition risks ?
- Is the project economically viable?

YES → ALIGNED

NO → NOT ALIGNED

STEP 03

Specify measures that can be incorporated to reduce the risks identified in Step 02

A. CLIMATE ADAPTATION MEASURES

Check sector-specific guidance

YES → ALIGNED

B. OPPORTUNITIES FOR CLIMATE MITIGATION

Check sector-specific guidance

YES → ALIGNED

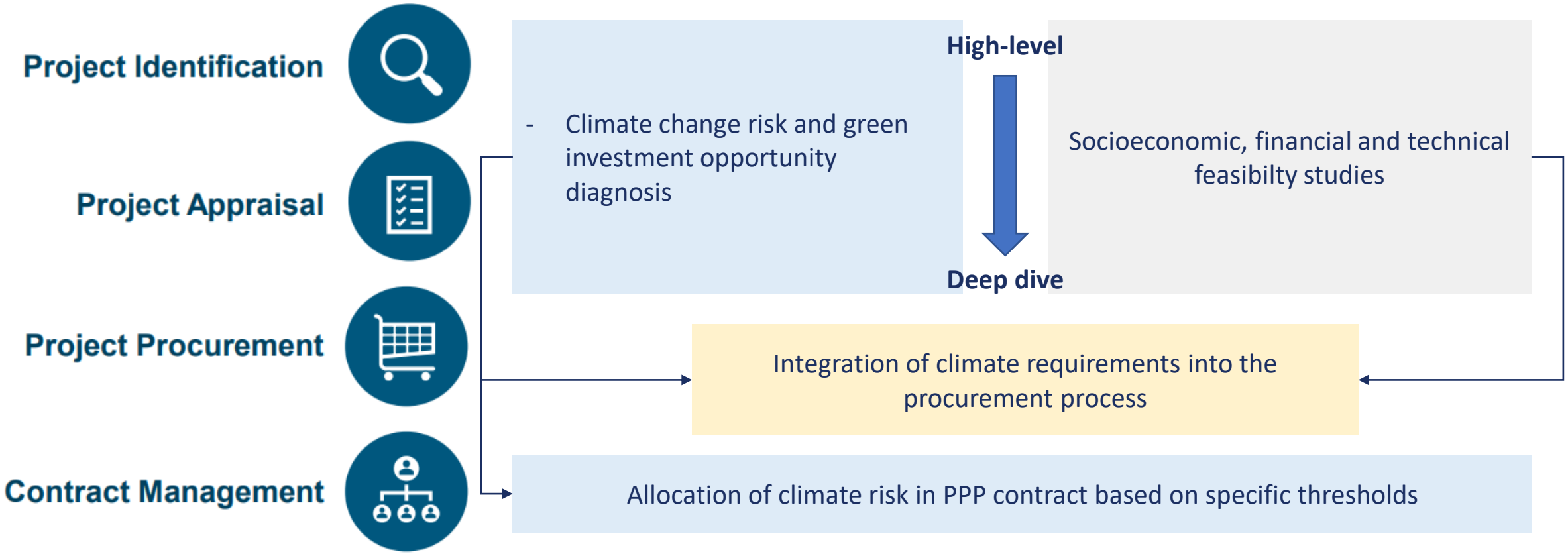
Sector considerations for Paris Alignment: Illustrative examples

Sector	Example subsector	Easy to justify	In need of thorough assessment
Transport	Roads	If the road the lowest carbon viable option, and includes low carbon construction materials, is part of a broader low carbon mobility strategy, EV infrastructure, public transport provisions	A road with no low carbon features
	Rail / mass transit	Rail and mass transit is easy to justify in most cases	If it involves rail transport of coal/peat (would not be aligned if predominantly for coal/peat)
Urban	Buildings	No heating from fossil fuels, use low carbon construction materials and adopting energy efficiency measures.	A building with no low carbon features
	District heating	Using significant renewable energy or waste heat or cogenerated heat OR including a) Modification to lower temperature delta; b) Advanced pilot systems (control and energy management, etc.)	Using fossil fuels
	Water supply	Water supply systems; water quality improvement; water efficiency; drought management; water management at watershed level	Water projects using fossil fuels such as diesel or petrol for water transfer or pumping
Energy	Energy generation	Generation of renewable energy from solar, wind, wave power, run-of-the-river hydro, geothermal, green hydrogen	Any projects involving fossil fuels (coal and peat non-aligned)
	Electricity transmission and distribution	Transmission/distribution not reliant upon fossil fuel derived energy	Projects designed to directly connect additional fossil fuel generation capacity

Responsibilities across stages of PPP projects

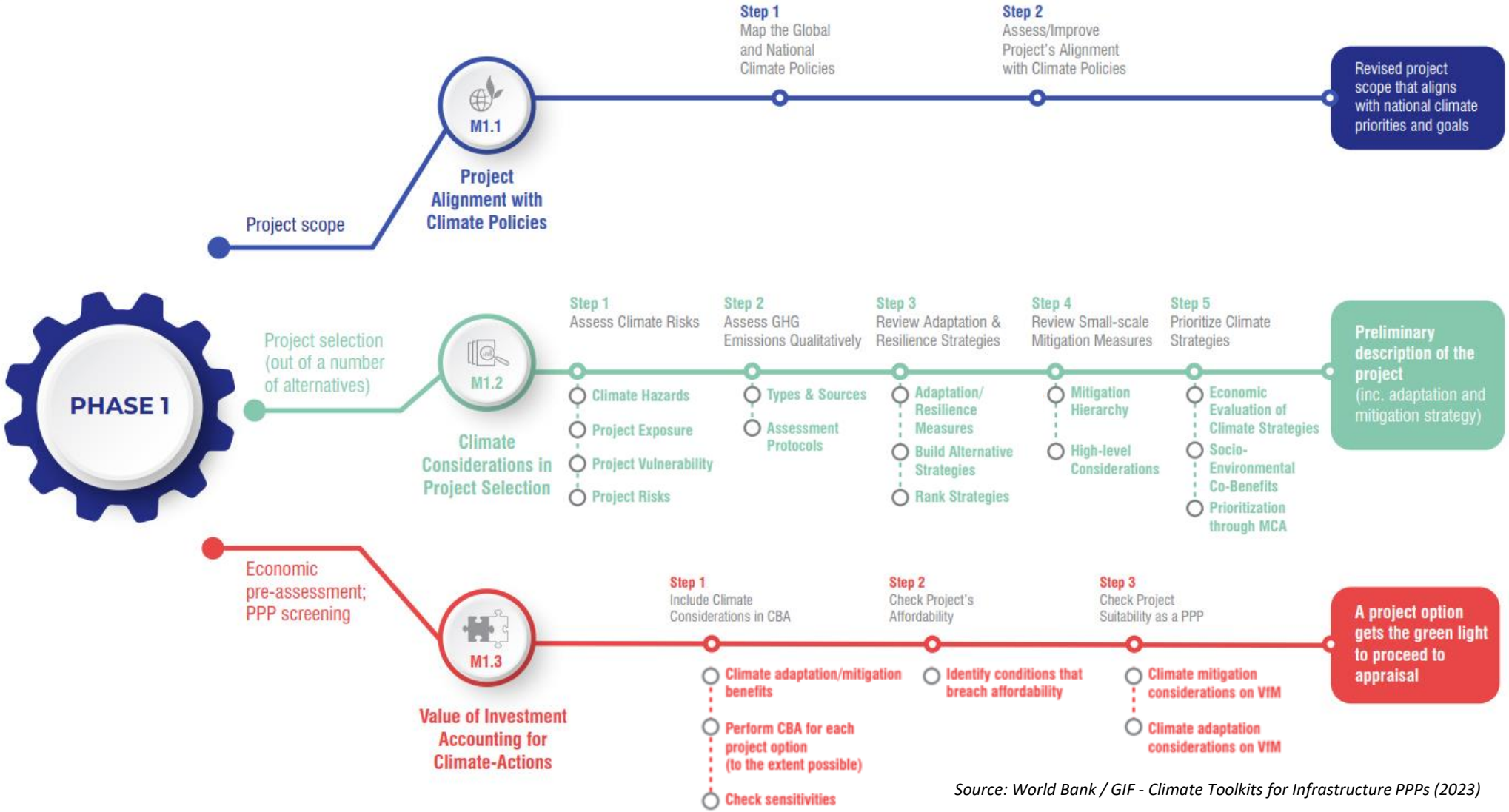
	PUBLIC SECTOR	PRIVATE SECTOR
Project Identification	...identifying and screening projects.	
Project Appraisal	...undertaking project appraisal.	...engaging in dialogue with the public party, conducting climate risk and GHG abatement options analysis.
Project Procurement	...specifying technical requirements for contractual structure.	...considering risk allocation.
Contract Management	...managing contract monitoring and performance requirements.	...delivery of project.

Assessments required to integrate climate change considerations in PPPs



Phase 1

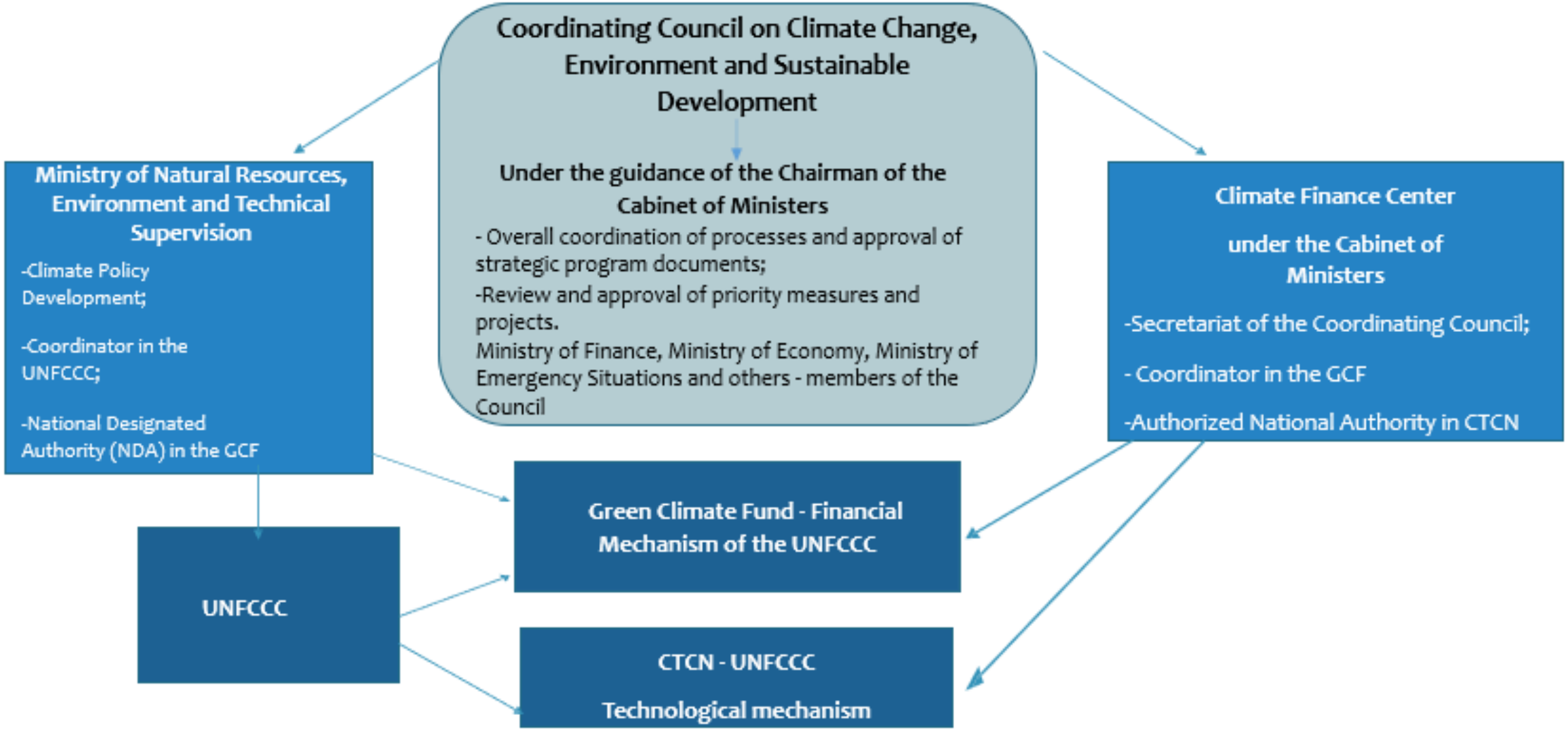
Project screening and identification



Source: World Bank / GIF - Climate Toolkits for Infrastructure PPPs (2023)

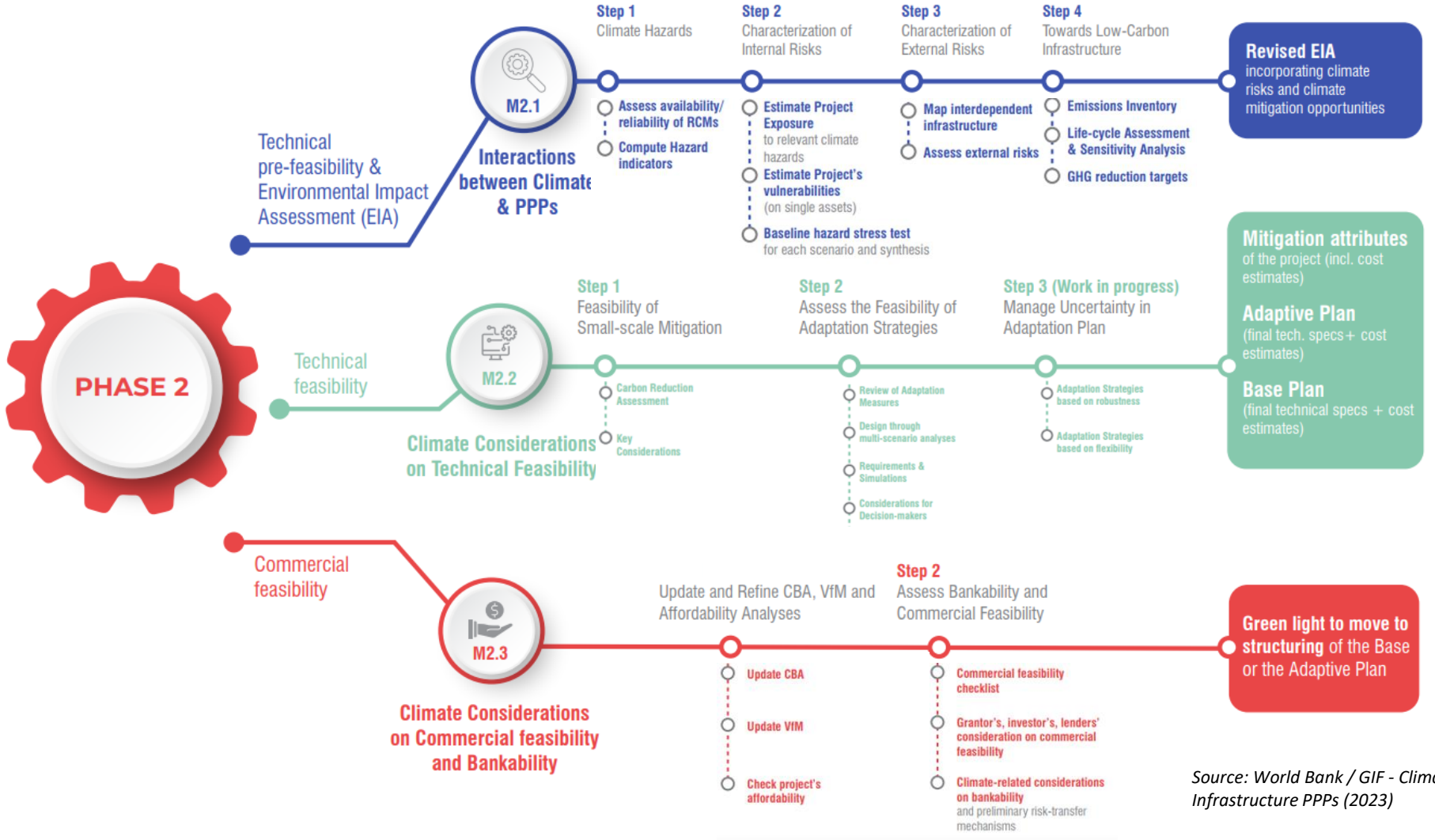
Ministries of Finance need to be actively involved in the NDC process

Kyrgyz Republic as a Model of Climate Finance Coordination Mechanism



Phase 2

Project preparation and appraisal

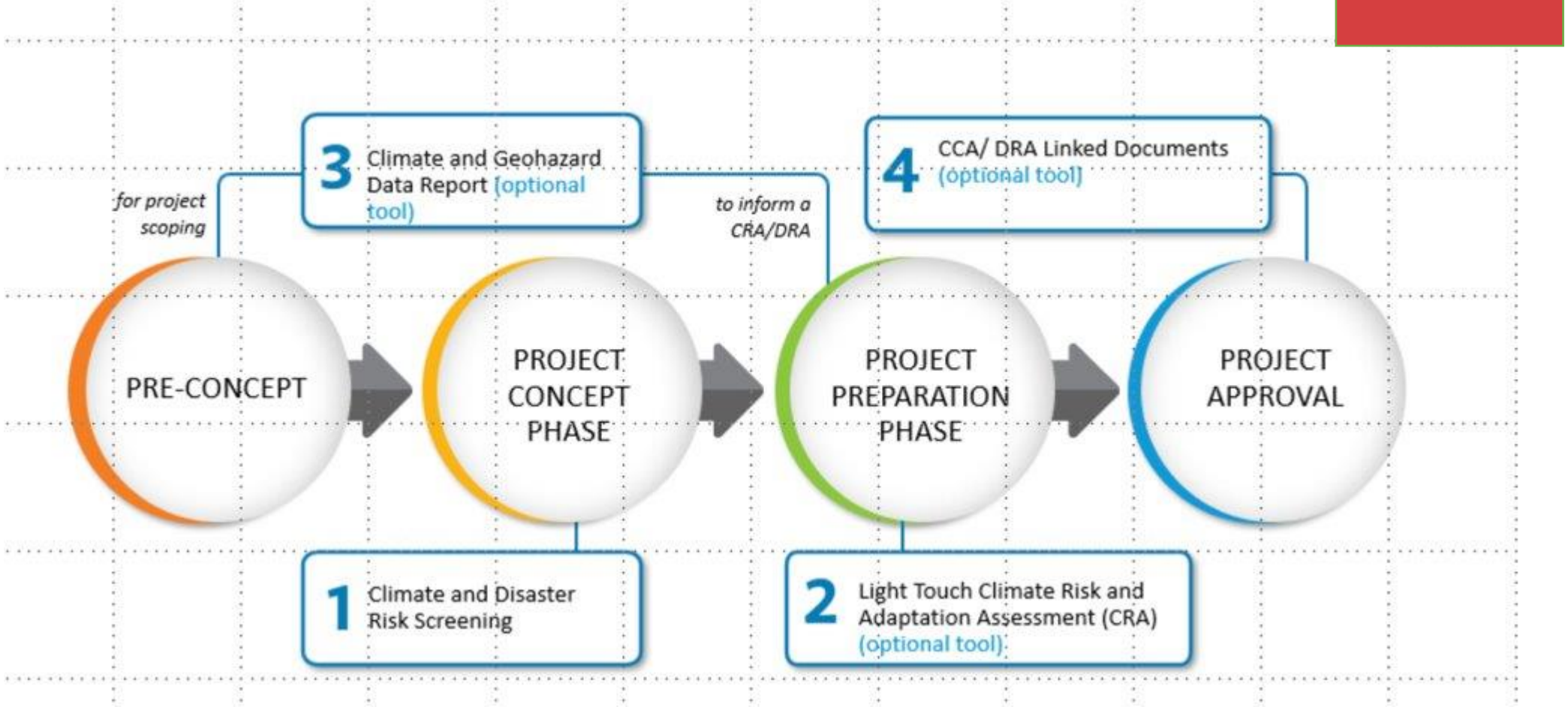


Source: World Bank / GIF - Climate Toolkits for Infrastructure PPPs (2023)

Phase 2

Project preparation and appraisal

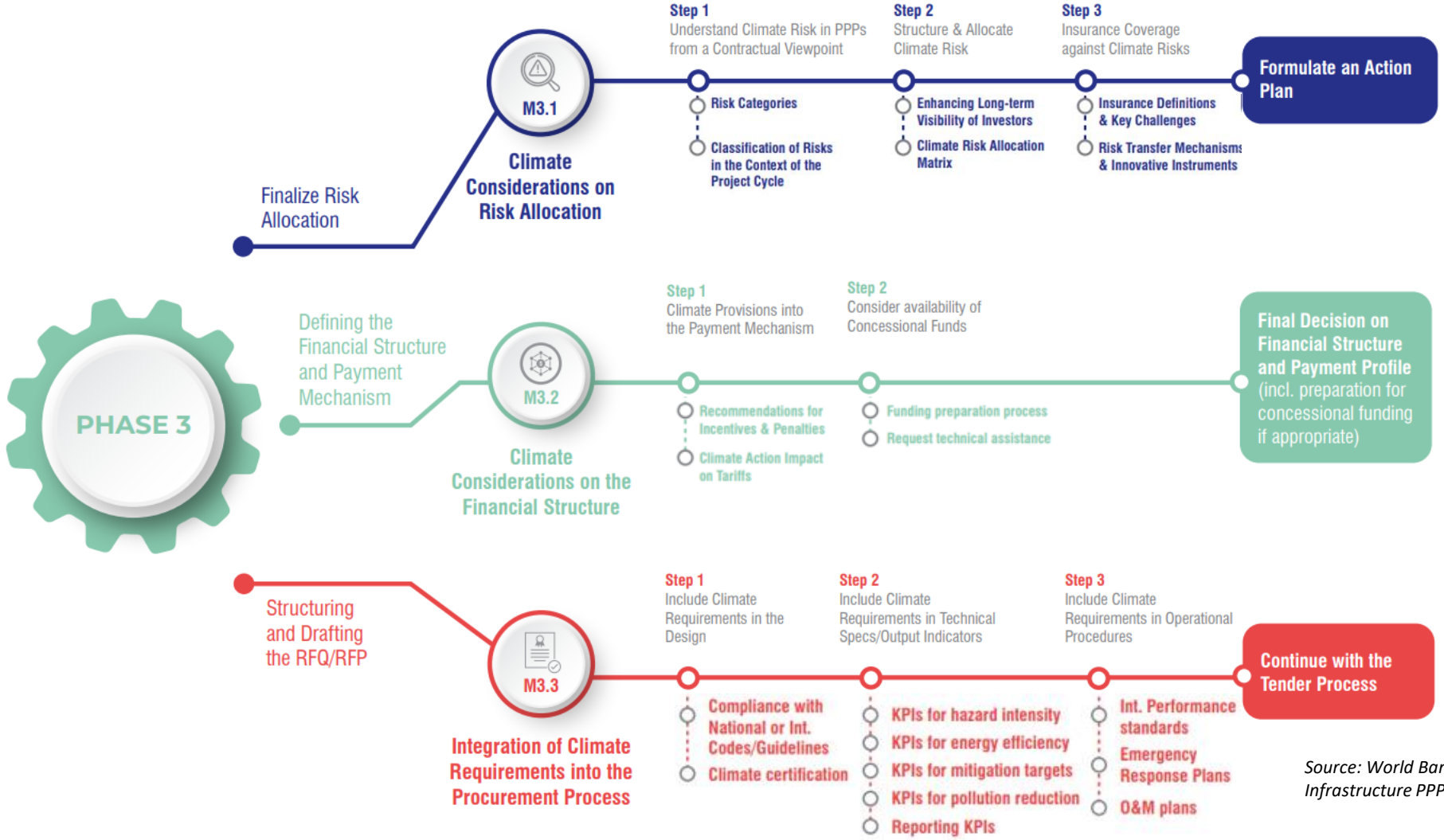
Tools



Source: World Bank

Phase 3

Project structuring and procurement

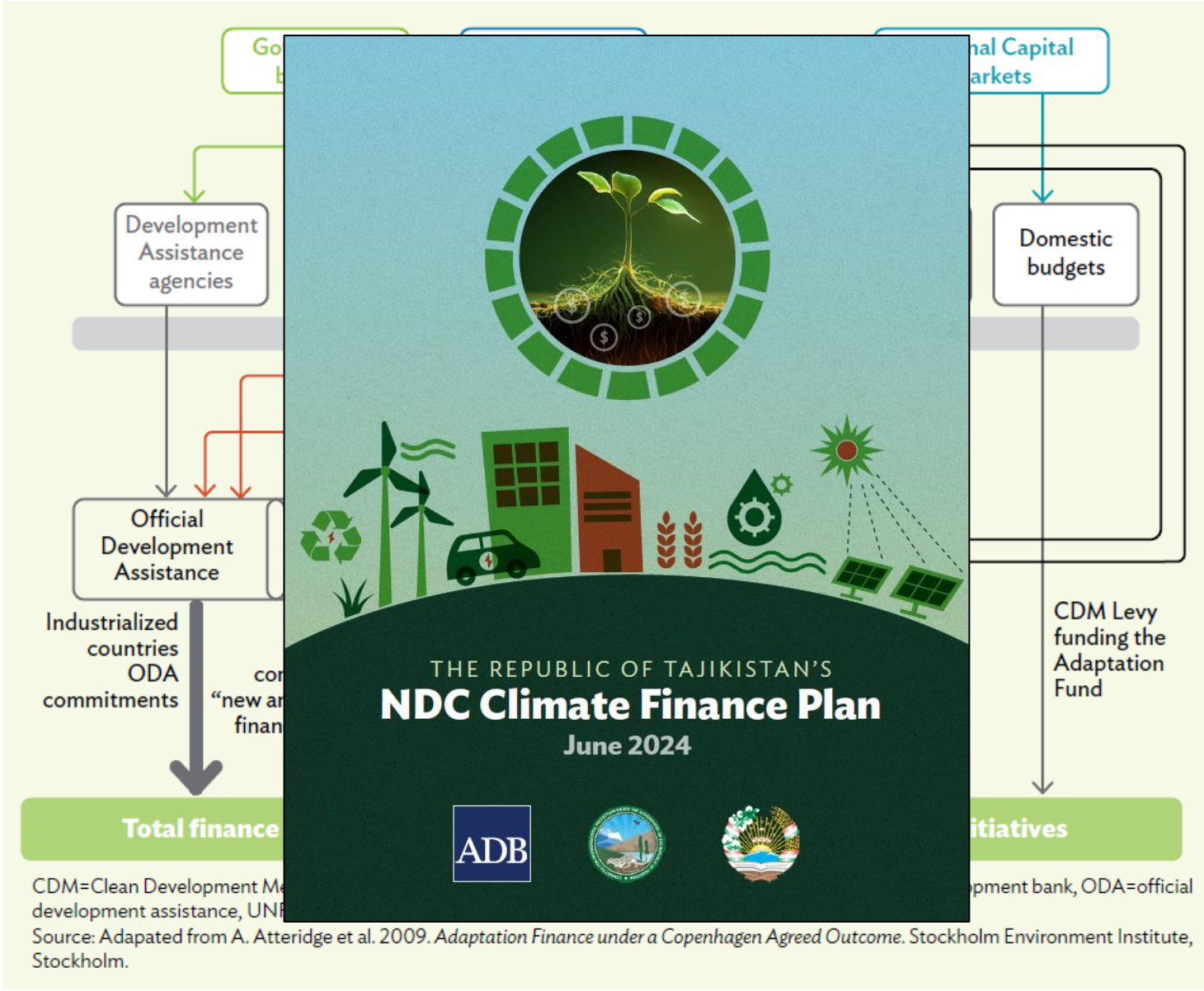


Source: World Bank / GIF - Climate Toolkits for Infrastructure PPPs (2023)

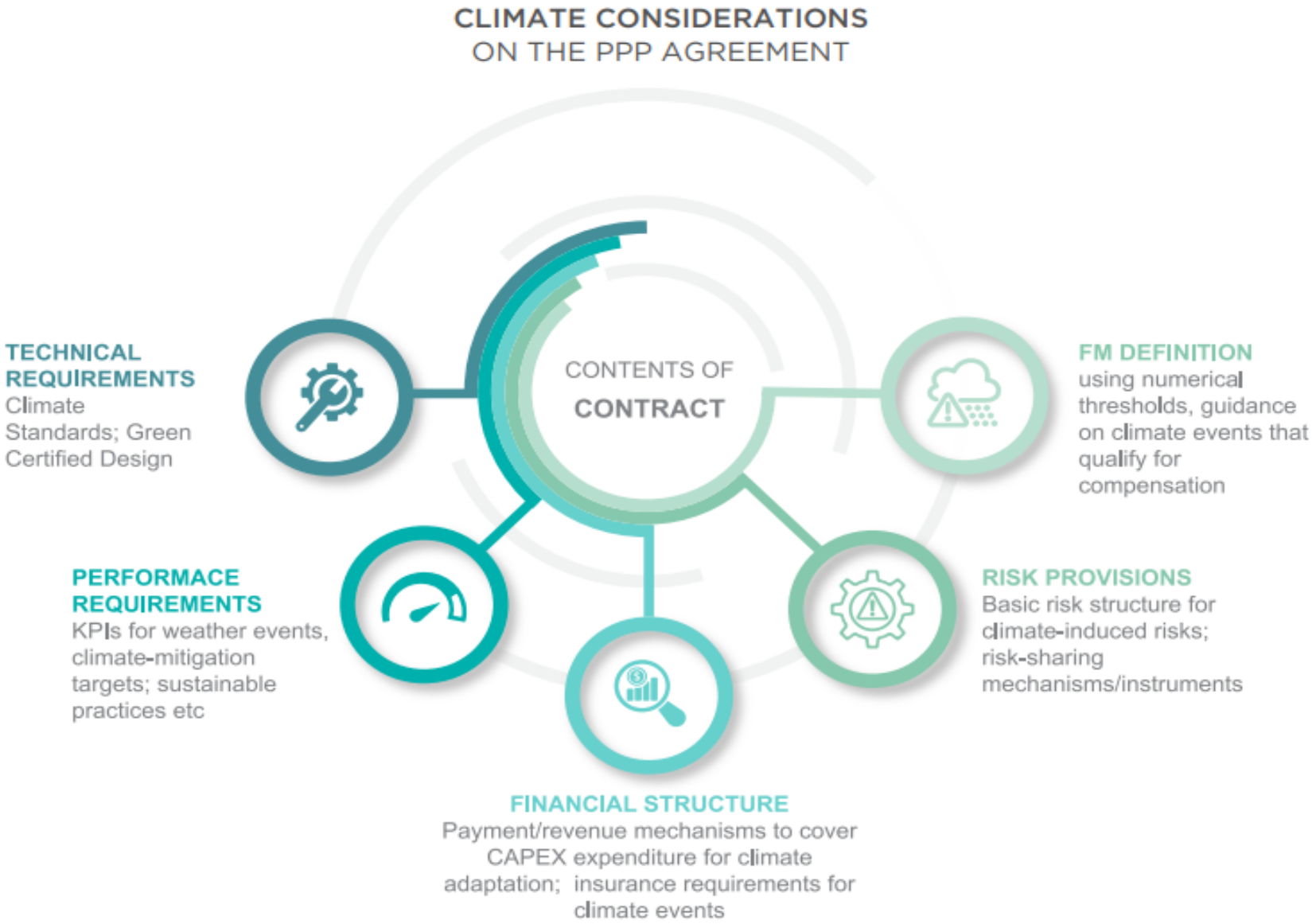
Project structuring and procurement

Overview of Global climate finance architecture

"While it is not strictly related to the financial structuring performed during the pre-tender stage (it is the winning bidder/investor's responsibility to obtain the means necessary to finance the project), it is relevant to explore the project's eligibility for innovative sources of climate financing, as it can trigger the need to embed in the overall contract structure some provisions that facilitate the project's attractiveness to such financing sources



Summary: Key climate considerations for PPP contracts



Source: World Bank / GIF - Climate Toolkits for Infrastructure PPPs (2023)

Case Studies

1 Future-proofing and modernizing Manila's airport infrastructure

Project and Mandate Overview

Country	Philippines	**Name of Private Partner**	SMC-SAP & Company Consortium (SSC) (San Miguel Holdings, Corp, RMM Asian Logistics Inc., RLW Aviation Development Inc., and Incheon International Airport Corp.)
Sector	Transportation	**Project Size**	US$2.2 billion
Name of Public Sector	Department of Transportation (DOTr)	**Timeline**	13 months to Commercial Close
		Commercial Close	2024

Project Background and Description

❖The Government of the Philippines is looking to optimize airport operations by expanding and modernizing the Ninoy Aquino International Airport (NAIA) through a Rehabilitate-Operate-Expand-Transfer arrangement.

Scope of Work

❖ADB provided Transaction Advisory Services to prepare the project for a solicited tender process for the rehabilitation, expansion, operation, and maintenance of NAIA.

Key Structuring Points

❖Optimized government receipts through an upfront and annuity payments, and revenue share

Climate Considerations

❖Incorporation of climate adaptation and climate change measures such as requiring a minimum of 20% of the airport's energy needs and encouraging the use of Sustainable Aviation Fuel (SAF)

Impact

❖Enhance and modernize airport capacity to address congestion, experience, reliability, and sustainability (avoidance of 20,000-30,000 tCO2),
❖Boost connectivity and economic growth.

1 Future-proofing and modernizing Manila's airport infrastructure

Key climate change challenges for airports:

- **NAIA airport is at risk from sea level rise and storm surges**, increasing the likelihood of closures, delays, and damages
- **Heat can affect plane capacity and restrict takeoff**, meaning fewer passenger and reduced capacity for luggage
- **Effectively tackling Scope 3 emissions is key to decarbonizing airports**, but several barriers hinder wide scale adoption of SAF

How these challenges were addressed at NAIA:

A. Risk assessment and adaptation planning:

- Comprehensive hazard risks assessment identified major vulnerabilities of NAIA airport
- Adaptation measures included improved drainage system to manage heavy rain fall and protect against floods

B. Reducing GHG footprint where possible

- Mandating of energy efficient lightning and solar rooftops,
- Mandating of 20% energy needs to be sourced from RE,
- Financial incentives to promoted uptake of SAFs in future
- Operational improvements to minimize aircraft fuel consumption

SCOPE 1

Emissions from airport-owned or airport controlled sources.

SCOPE 2

Indirect emissions from the consumption of purchased energy

Scope 1 & 2 emissions fall under the direct control and influence of the airport, and depend on the energy use of owned stationary (e.g. terminal) and mobile (e.g. buses)

SCOPE 3

Indirect emissions from other sources related to the activities of an airport

Scope 3 emissions are outside of the direct control of the airport, and relate to emissions from 3rd party users of the airport – airlines, ground-handlers, tenants, passengers & staff.

2 Decarbonizing heat supply through District Heating in Tashkent

Project and Mandate Overview

Country	Uzbekistan	**Name of Private Partner**	Veolia Energy Tashkent
Sector	Energy	**Project Size**	Eur 1.4 billion
Name of Public Sector	Tashkent City Municipality (TCM)	**Timeline**	26 months to Commercial Close
		Commercial Close	2021
		Financial Close	2022

Project Background and Description

❖Tashkent City Municipality (TCM) received an unsolicited proposal (USP) for the refurbishment and long-term operation of Tashkent City District Heating (DH) Network, implemented as a privately-initiated project under the Public-Private Partnership (PPP) Law with technical assistance from ADB's Asia Pacific Project Preparation Facility.

Scope of Work

❖Transaction Advisor for TCM, providing assistance in project structuring, tender preparation, negotiation, commercial closing support, and project monitoring for the project's implementation.

Key Structuring Points

❖In this hybrid PPP structure, the private partner manages the network, bill invoicing and collection, with modernization funded from collected tariffs and government support for tariff affordability.

❖The public partner finances the Modernization and Public Investment Programs through a dedicated fund established solely for the project within TCM.

Impact

❖The project reconfigures the open network to an integrated heat supply scheme, enhancing safety and achieving gas, energy, and water savings of 25 - 40%.

❖By introducing metering devices, it promotes awareness of sustainable energy usage among citizens and local businesses, supported by a $20 million private sector investment.

2 Decarbonizing heat supply through District Heating in Tashkent

Snapshot

Public Partner	• Tashkent City Municipality (TCM)
Private Partner	• Veolia Energy Tashkent
PPP Scope	• **Affermage Structure –** ▪ Public Partner Role : Infrastructure owner & CAPEX Investment. Revenue (lease fee) share of user charges ▪ Private Partner Role: 30-year lease with responsibility for operating and maintaining infrastructure. Revenue is share of user charges
Tendering	• Unsolicited Proposal – Private partner
Timeline	• Unsolicited Proposal: July-20 • ADB TAS start: Aug-20 • Commercial Close: Aug-2021 • Financial Close: July-2022 • Project start: July-2022 • Current status: Operational

Project Description

District Heat Infrastructure

Private Partner: Maintenance & Operations

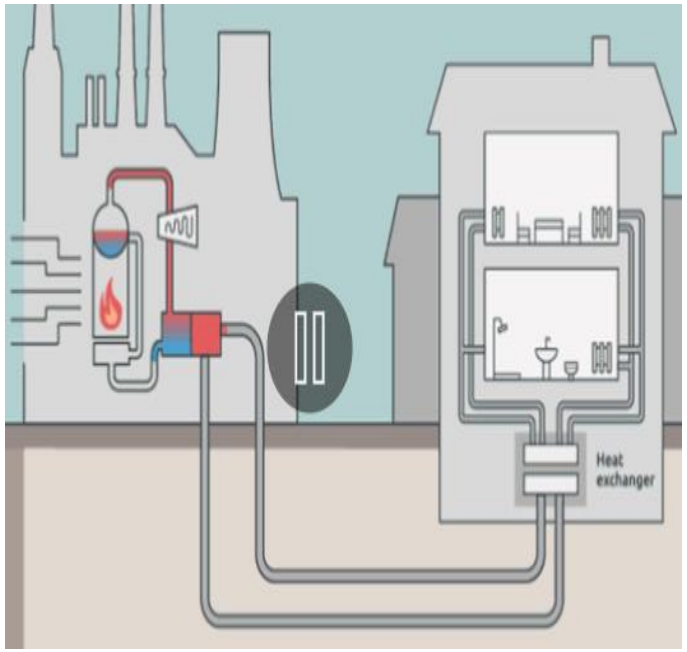
Public Partner: Ownership & CAPEX investment

Background & Context

- Tashkent's District Heating system is in need of retrofitting and modernization as it was developed around 6 decades. The system was operated by an SOE that lacked the expertise and resource to modernize the system.
- The private partner approached the Tashkent municipality with an unsolicited offer to do so.
- Project Concept: Energy and Resource optimization project –a gradual transition from 1st to 4th generation district heating system - funded by lease fees collected from private partner's asset optimization. This using an *Affermage* PPP structure.

Climate Aspects

- **Main Climate Risks:** Flooding, extreme weather and drought
- **Climate Adaptation and Mitigation Technologies:** Wide range of technologies including:
  - Advanced real-time digital energy management and control systems; digitized metering of hot water and heat; efficient pumping stations and boiler rooms, individual heat substations (heat exchanges), replacement of non-insulated steel pipes with insulated plastic pipes etc.
- **Climate Adaptation impact :**
  - Reduced exposure to drought and water scarcity due to 60% reduction in water losses.
  - Reduced exposure to extreme weather and flooding events due to removal of overhead pipes and digital control system



Climate Impacts

- Expected GHG ER >40% due to reduction of
  - Network heat losses >40%;
  - No. breakages > 60%;
  - Water leakage >60%;
  - Electricity savings> 15%;
- Long-term option to integrate high-efficiency heat sources & RE

Unlocking Uzbekistan's renewable power potential with 1GW solar tender

Project and Mandate Overview

Country	Uzbekistan	**Name of Private Partner**	Abu Dhabi Future Energy Company (Masdar)
Sector	Energy	**Project Size**	US$290 million
Name of Public Sector	National Electric Grid of Uzbekistan (NEGU)	**Timeline**	24 months to Commercial Close
		Commercial Close	2021
		Financial Close	2023

Project Background and Description

❖In 2019, the Government of Uzbekistan (GoU) partnered with ADB for a 1GW solar Public-Private Partnership (PPP) program, initiating the Sherabad Solar PPP project, entailing the construction of a 457 MW solar power plant and a 52km transmission line near the city of Sherabad in Southern Uzbekistan.

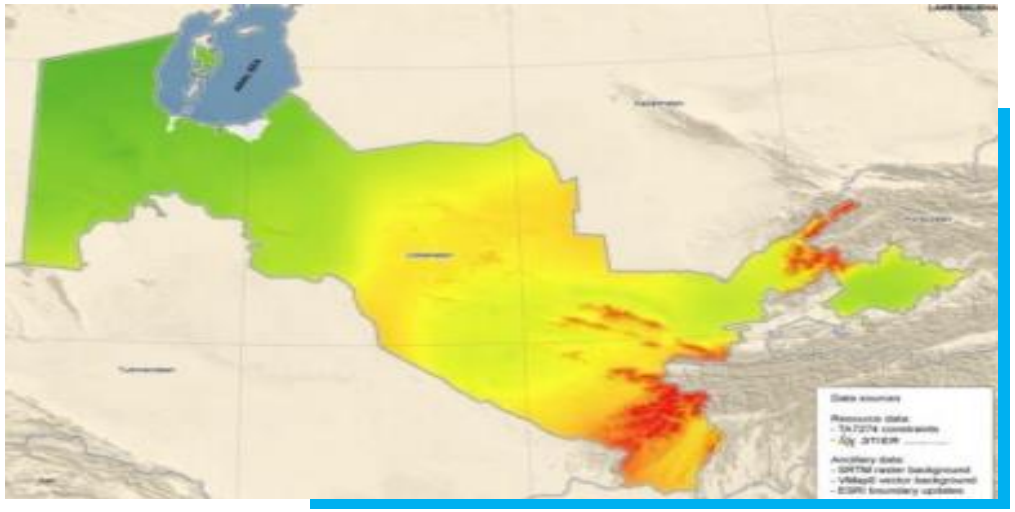
Key Structuring Points

❖Enhanced risk allocation: ADB's advisory team devised a more favorable risk allocation for the GoU, ensuring improved key performance indicators, reduced due diligence risk, and shifted irradiation risk to bidders, ultimately delivering increased value for the GoU.

❖ADB Partial Credit Guarantees (PCG) for power offtake: ADB structured a Payment Credit Guarantee (PCG) involving a letter of credit from an acceptable bank, backed by ADB, covering three months of ongoing payment obligations of the offtaker NEGU, subject to ADB policies, benefiting the project company.

Scope of Work

❖Advised GoU on project structuring, negotiation, tender preparation, management, and facilitated commercial and financial closing.



Impact

❖Boost in Uzbekistan's power generation capacity through local energy sources, the first large-scale power project in Surkhandarya province, facilitating an industrial park setup, and potential power exports.

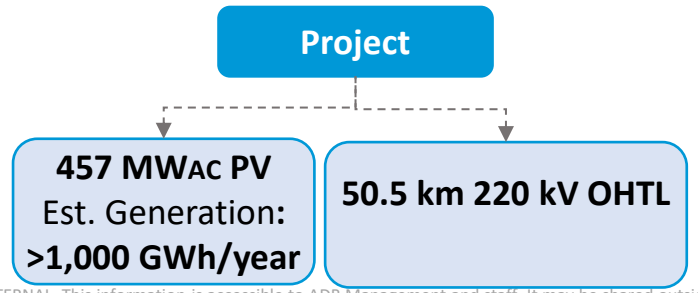
❖Attaining a tariff of 1.80 c/kWh, the lowest in Asia Pacific for grid-connected solar PV, now sets a benchmark for future solar tenders in Uzbekistan and the broader region.

3 Unlocking Uzbekistan's renewable power potential with 1GW solar tender

Snapshot

Offtaker	• NEGU – National Electric Grid of Uzbekistan • MIFT – Ministry of Investment and Foreign Trade
Private Partner	• Masdar SPV – Nur Sherabad
PPP Scope	• Design, Build, Finance, Own, Operate, Maintain 457MWAC solar plant • Design, Build, Finance and Transfer 50.5 km Transmission Line
Tendering	• Competitive Tender
Timeline	• EOI Launch: Feb-20 • Financial Bid Opened: May-21 • Commercial Close: Aug-21 • Financial Close: Mar-23 • Current status: Construction • COD: Q1-2027

Project Description

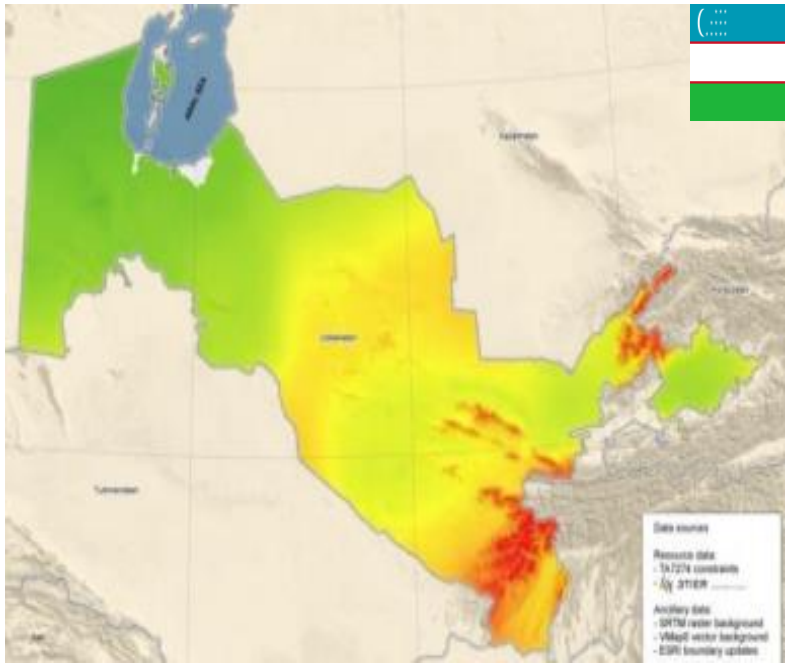


Background & Context

- Capacity Building and Enabling Environment (2019)–ADB support in design of national power sector master plan with focus on expansion of renewables, decarbonization, and creation of enabling environment for investment.
- Uzbekistan MoE target by 2030 – Installation of 12 GW of RE with 7 GW solar and 5 GW wind capacity
- Project Preparation and Transaction Advisory (2019 onwards)– ADB advising the Govt. of Uzbekistan on the development of a 1GW PPP PV Solar Program. 1st project - Sherabad 200+MW.

Climate Aspects

- **Main Climate Risks:** Medium risk of flooding and heatwaves
- **Climate Adaptation Technologies & Approaches**
  - Integration of climate adaptation technical specification in tender documentation
  - Design stage: drainage system, PV module panel foundations, electric system components(inverters, transformers, etc)
  - Meteorological stations
  - Water conservation measures
- **Climate Mitigation Technologies:** High efficiency system–bifacial PV modules + single-axis tracking



Climate Impacts & Duplication potential

- Annual GHG ER : >500,000 tCO2e
- Price discovery through open tender – Tariff 40% lower than estimated
- Substantial increase in international private sector exposure + Reduced risk perception
- Continued development of solar project pipeline
- RE projects Improved grid connection due to TL construction

Thank you