



Positive momentum for climate action, but challenges remain

Bottom-up Approach



The Paris Agreement introduced a bottom-up approach to address climate change through individual country commitments

Below 2°C Goal



Pledges made under NDCs only cover about 1/3rd of the emission reductions needed to be on a least-cost pathway to stay below 2°C

High Financing Needs



Achieving NDC goals will require massive international and national sources of climate finance

Need for Leverage



Public finance is limited and needs to be leveraged intelligently to attract private capital

Climate markets can address these challenges



...by reducing costs...

- Market efficiencies reduce the cost of low carbon growth.
- International cooperation through carbon markets can reduce the global cost of implementing NDCs by US\$115 billion by 2030 and US\$1.9 trillion by 2050.*



...and increasing resource mobilization

- Markets crowd-in public and private capital and leverage limited concessional resources.
- \$1 invested in emission reductions under the Clean Development Mechanism (CDM), benefitted \$4.60 to \$10 in underlying low carbon investment.**

The World Bank Group (WBG) is uniquely positioned to catalyze the creation of climate markets

* WBG "State and Trends of Carbon Pricing 2016; TIAM-Grantham

** WBG "State and Trends of the Carbon Market 2010" report; [UNFCCC](#)

Article 6 of the Paris Agreement provides for voluntary cooperation among countries

Under Paris, Article 6 is the opening for developing markets – however, guidance and rules are still under negotiation by Parties

	Article 6.2	Article 6.4
Objectives	Using cooperative approaches to enhance mitigation ambition under NDCs	
Governance	Under bi- or plurilateral governance	Under the authority and supervision of the COP
Metrics	Introduces “mitigation outcomes” (MOs) which can be produced from any mechanism/procedure/protocol	“a mechanism to contribute to the mitigation of GHG and support sustainable development”

VISION

ENHANCE GLOBAL AMBITION THROUGH CLIMATE MARKETS



Mobilize capital for resilient & low carbon growth by connecting climate markets



INVESTMENT SERVICES

- Mobilize public and private capital. Create initial market liquidity:
- Create initial demand for transfers of climate assets
 - Generate supply of climate assets

KNOWLEDGE SERVICES

- Develop concepts and methodologies around:
- Asset creation and exchange
 - Market regulation and institutional frameworks
 - Financial products
 - Market solutions for adaptation
- Thought leadership on market intelligence

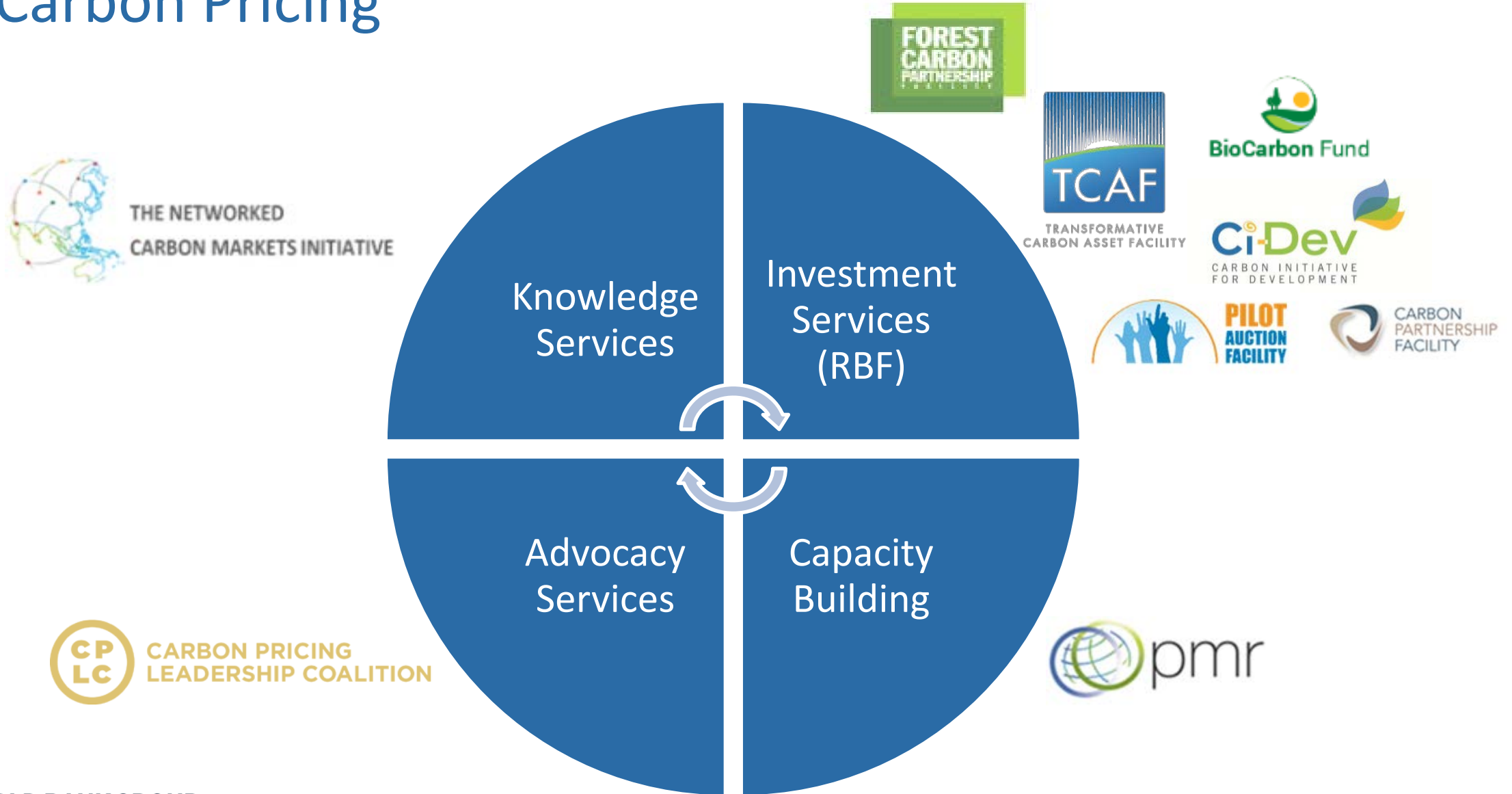
CAPACITY BUILDING

- Build countries' readiness and infrastructure to generate and transfer climate assets
- Support low-carbon development policies and instruments
- Strengthen and harmonize clients' NDCs

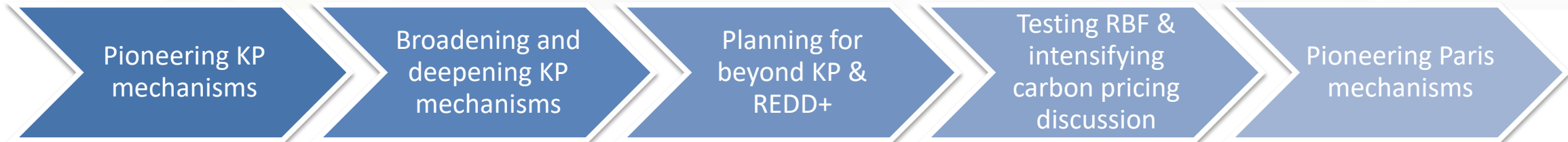
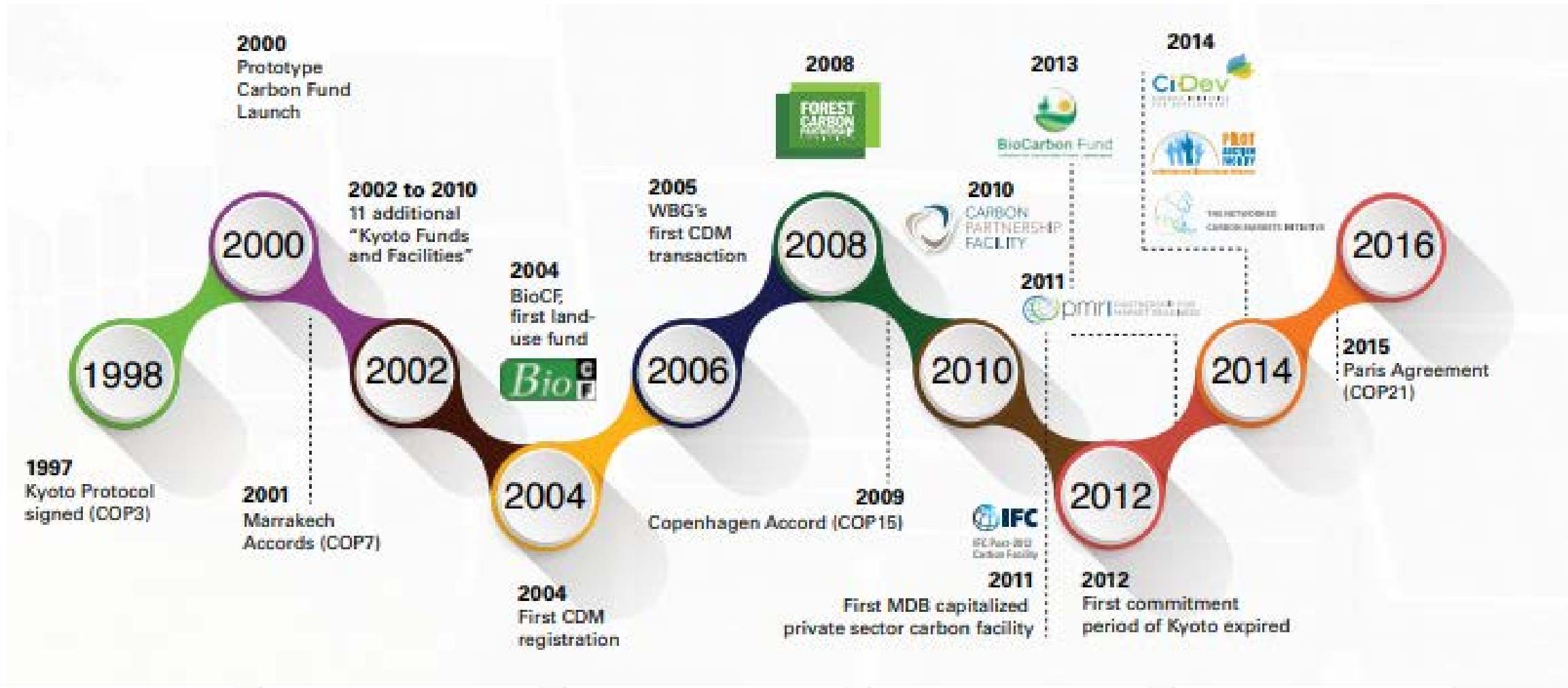
ADVOCACY SERVICES

- Understand stakeholders' expectations
- Partner with key/interested stakeholders
- Build consensus and awareness on key design elements

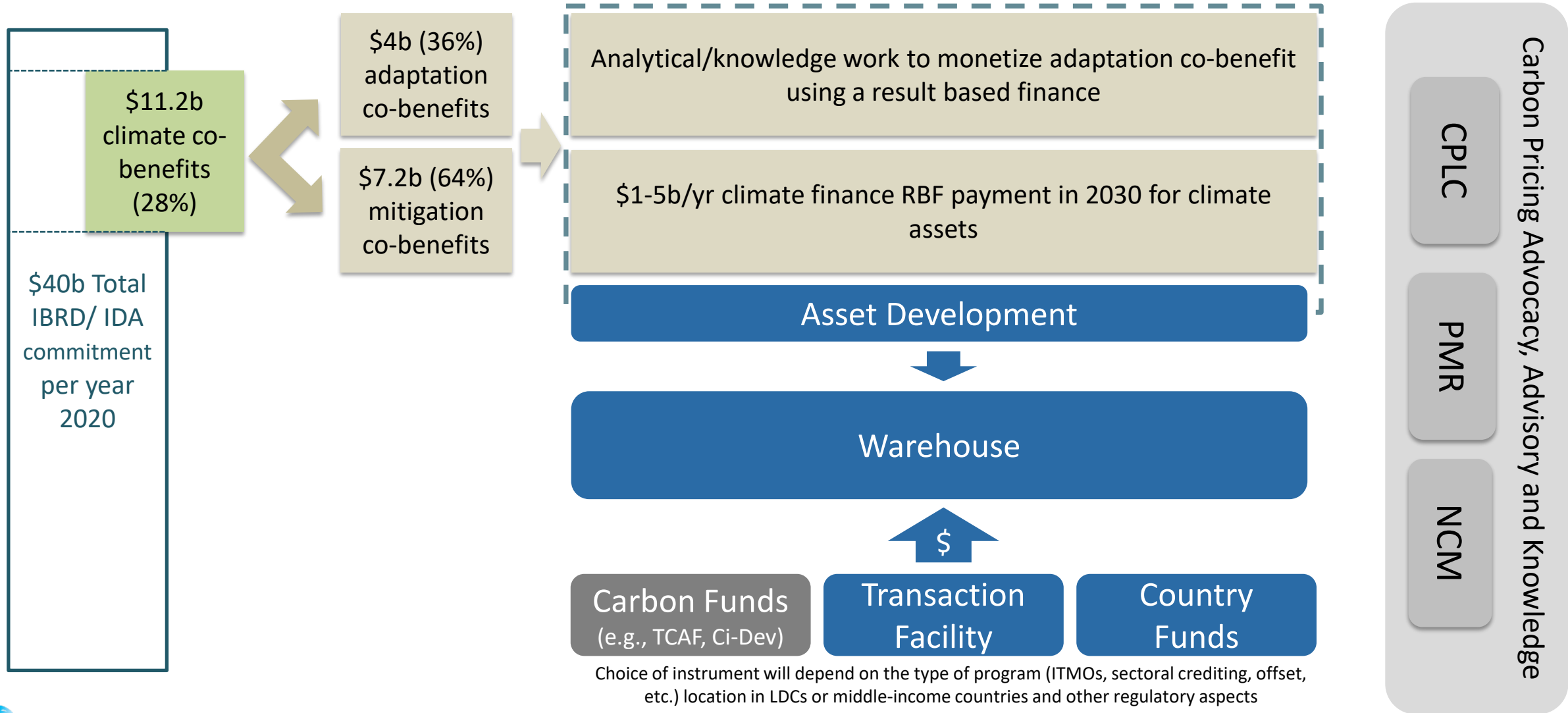
WB's Products and Services on Climate Markets and Carbon Pricing



Evolution of carbon mechanisms at the WBG



World Bank's (WB) own portfolio of investments generate climate benefits



The WBG is developing programs and products to operationalize markets under Article 6



Asset Development

Generate supply of MOs from the Bank's lending operations



Warehouse

Provide infrastructure for standardized assessment, recording and transferring of MOs



Transaction facility

Facilitate demand and transactions for MOs through the design of financial instruments and products



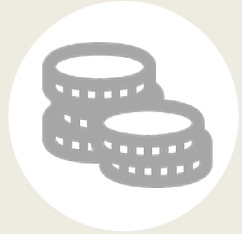
Quantification and verification of emission reductions offers several benefits

Use for NDCs



Quantified and verified emission reductions may be used by the country towards its own NDC goals

Potential Monetization



Monetization can reduce overall cost of capital for identified low-carbon projects by providing an additional revenue stream

Catalyze investment



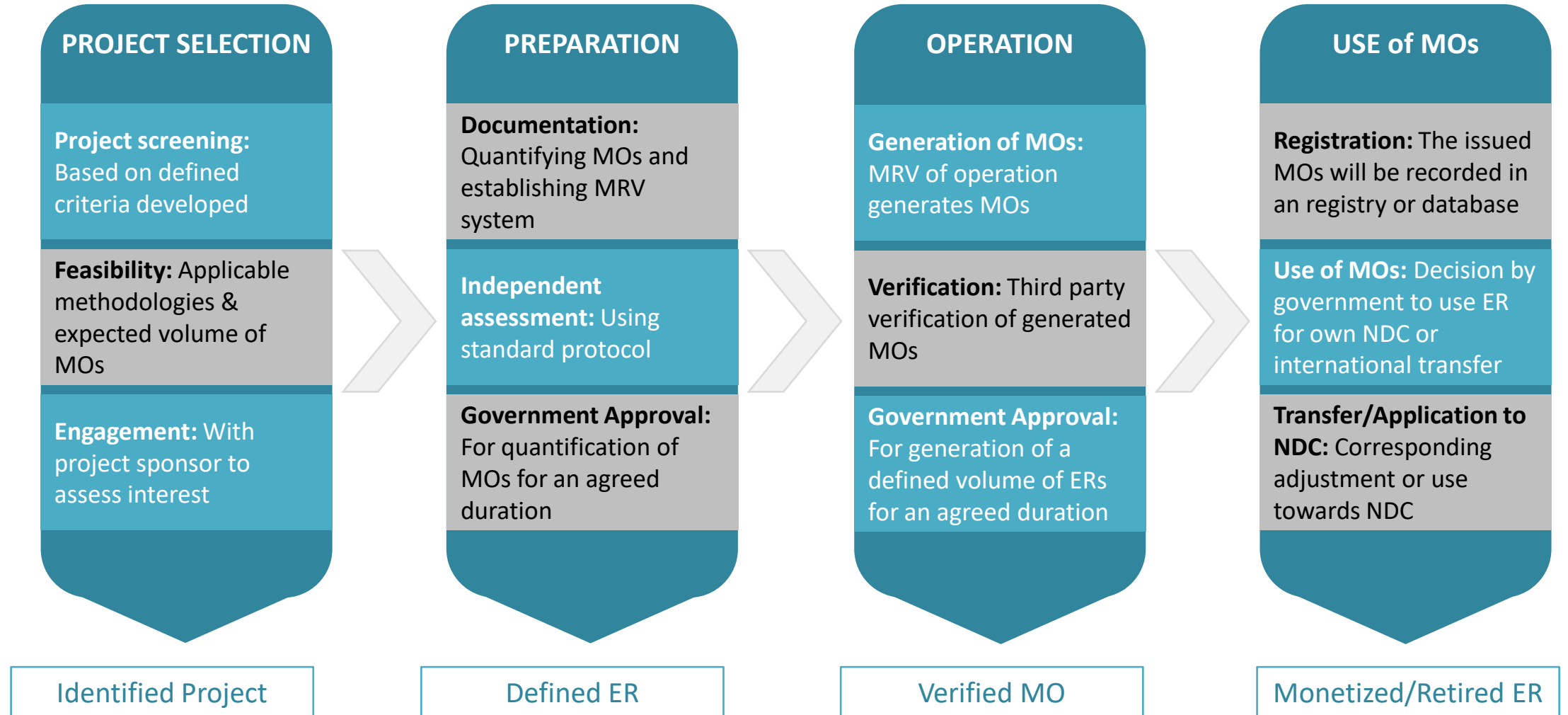
Provide a price signal for emission reductions to incentivize additional private investment in identified sectors

Capacity building



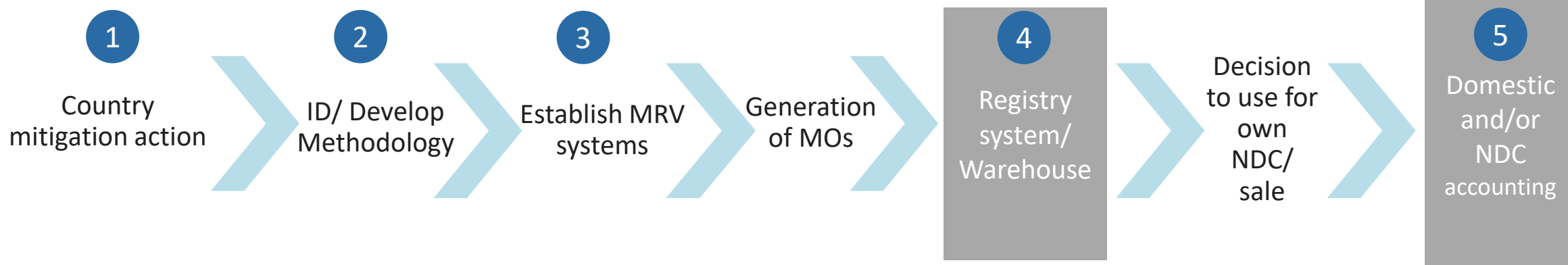
Build domestic capacity and establish institutional mechanisms and processes for participation in climate markets

Quantify, monitor, report, and verify MOs from WBG operations

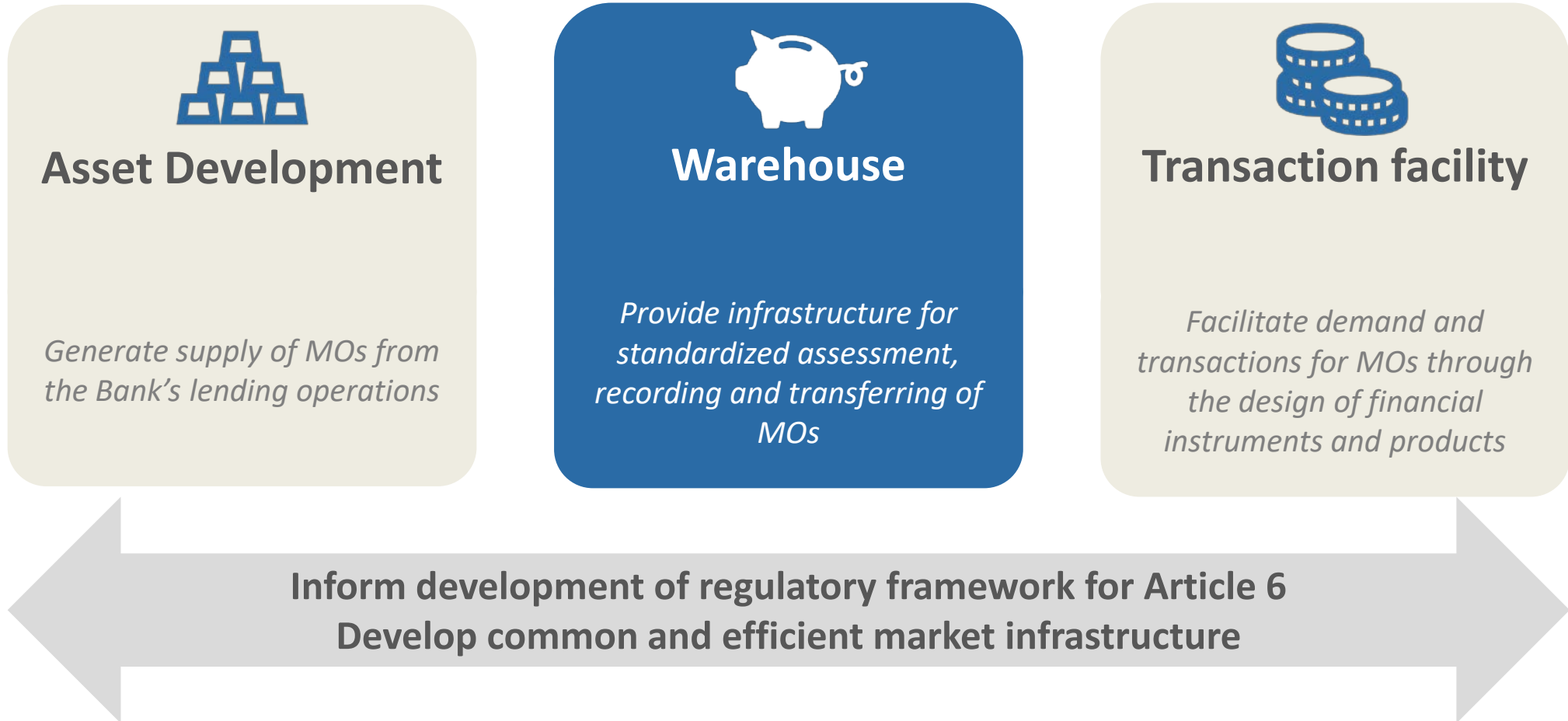


Generation of MOs from WB operations...

- The WB will initially focus on climate co-benefits generated from its own portfolio of lending operations
- The WB will develop this approach through a consensus-driven process with the **MDB Working Group on Article 6**, and collaboratively pilot the creation of MOs through **MDB operations with high mitigation potential**
- Country engagement is required at all stages of the MO generation process below. World Bank can provide technical support in stage 1-5.



The WBG is developing programs and products to operationalize markets under Article 6



A transparent inventory of available MOs

The Warehouse Facility will “house” MOs from WB (and MDBs) operations. A user interface will allow buyers to have access to MOs and its underlying information

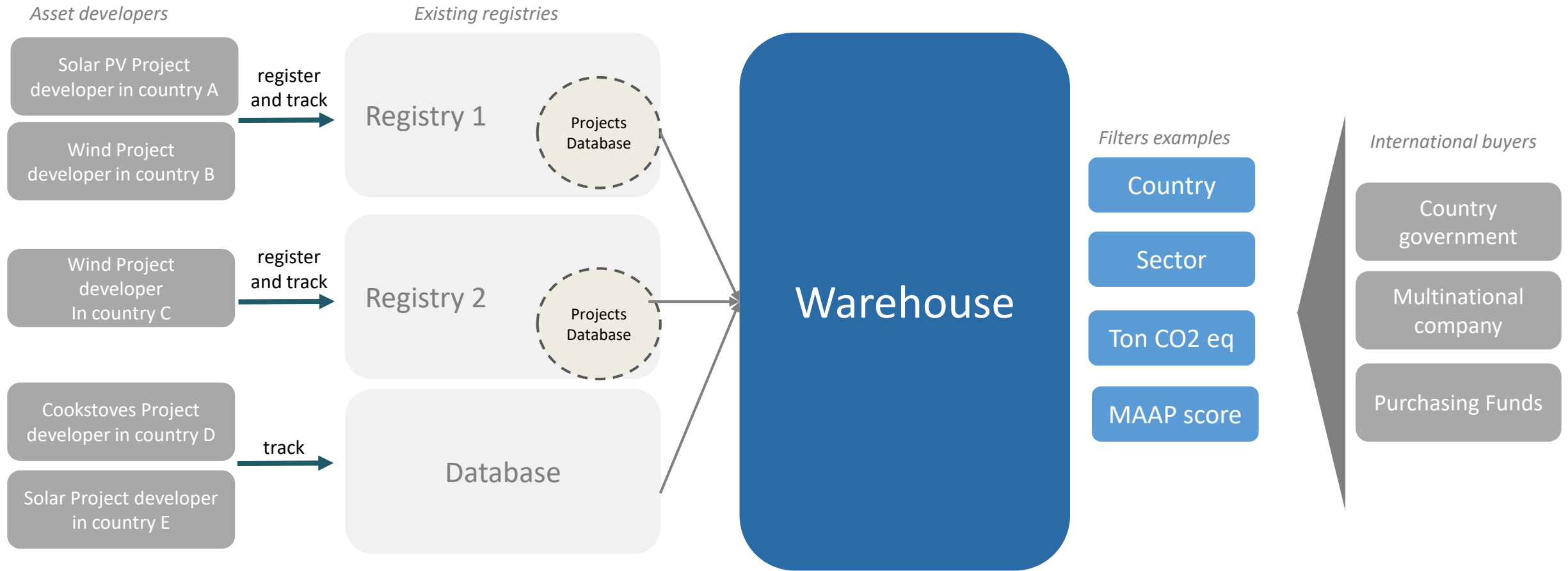
Warehouse climate assets

- Create and maintain a registry and for recording and tracking MOs
- Assess each MO entering the warehouse using the and international protocol (e.g., MAAP), allowing buyers to compare and benchmark the relative performance and risks of the underlying climate actions and MOs
- Present a transparent inventory of the available MOs to potential buyers

Facilitating use of MOs

- Identify process/modalities for the use of MOs for NDC compliance by the generating Party (host country)
- Identify regulatory clearances and approvals within the host country for the sale and transfer of MOs
- Develop template documents for transfer of MOs
- Charge fees for cost recovery for the development of MOs and maintaining the Warehouse

The Warehouse Facility will serve as a transparent inventory of available ERs



The WBG is developing programs and products to operationalize markets under Article 6



Asset Development

Generate supply of MOs from the Bank's lending operations



Warehouse

Provide infrastructure for standardized assessment, recording and transferring of MOs

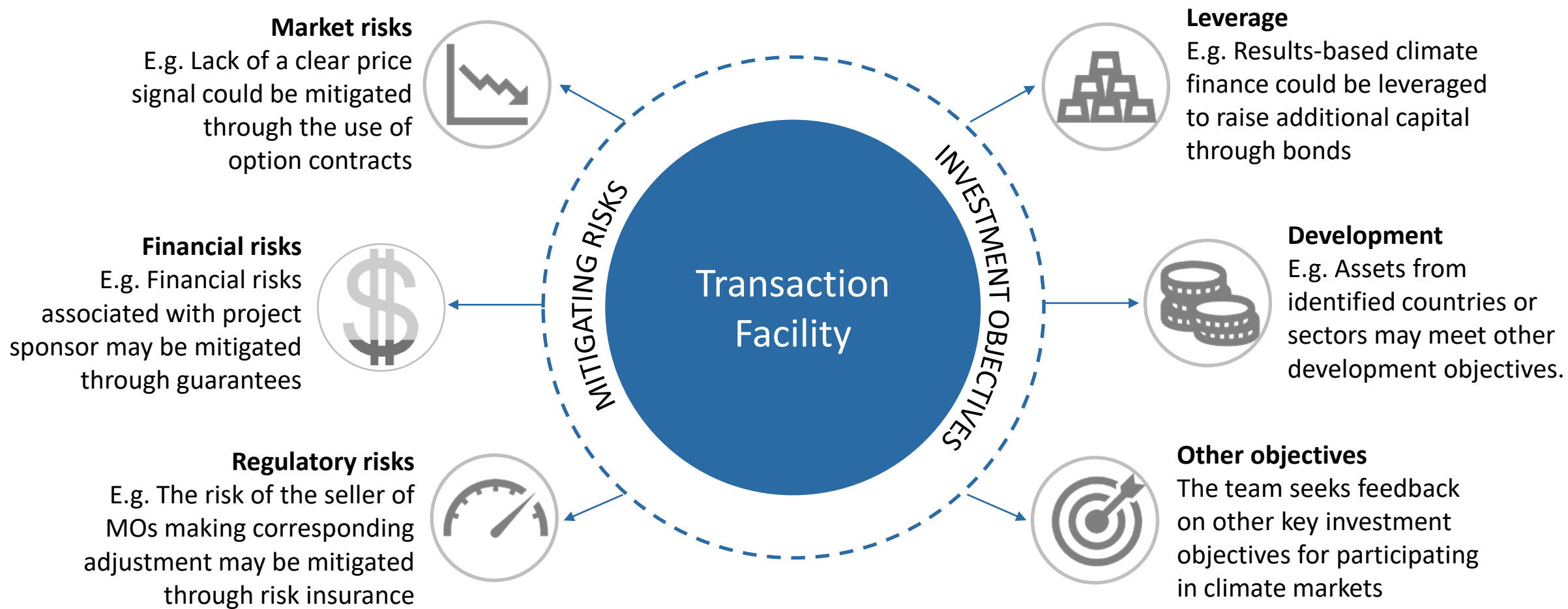


Transaction facility

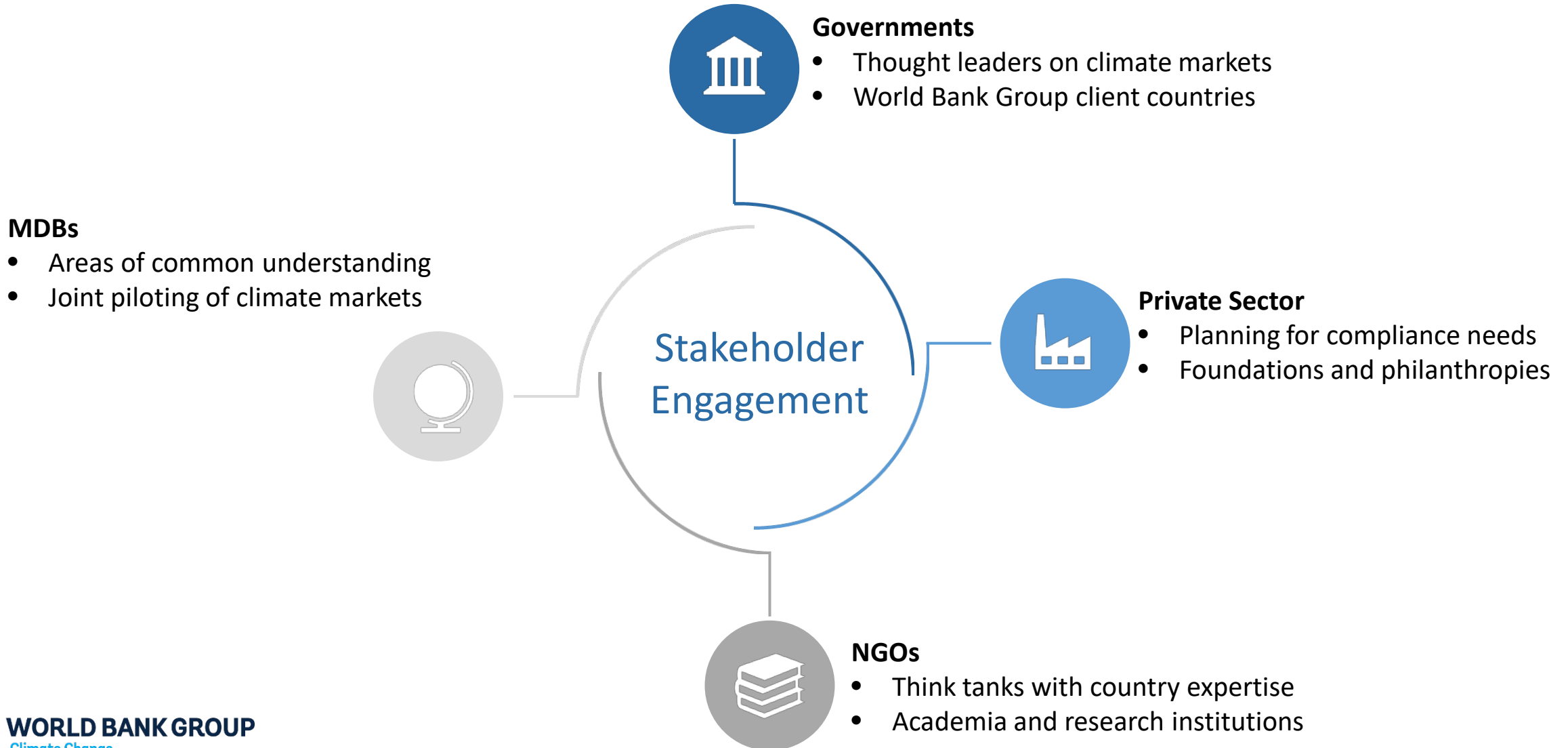
Facilitate demand and transactions for MOs through the design of financial instruments and products



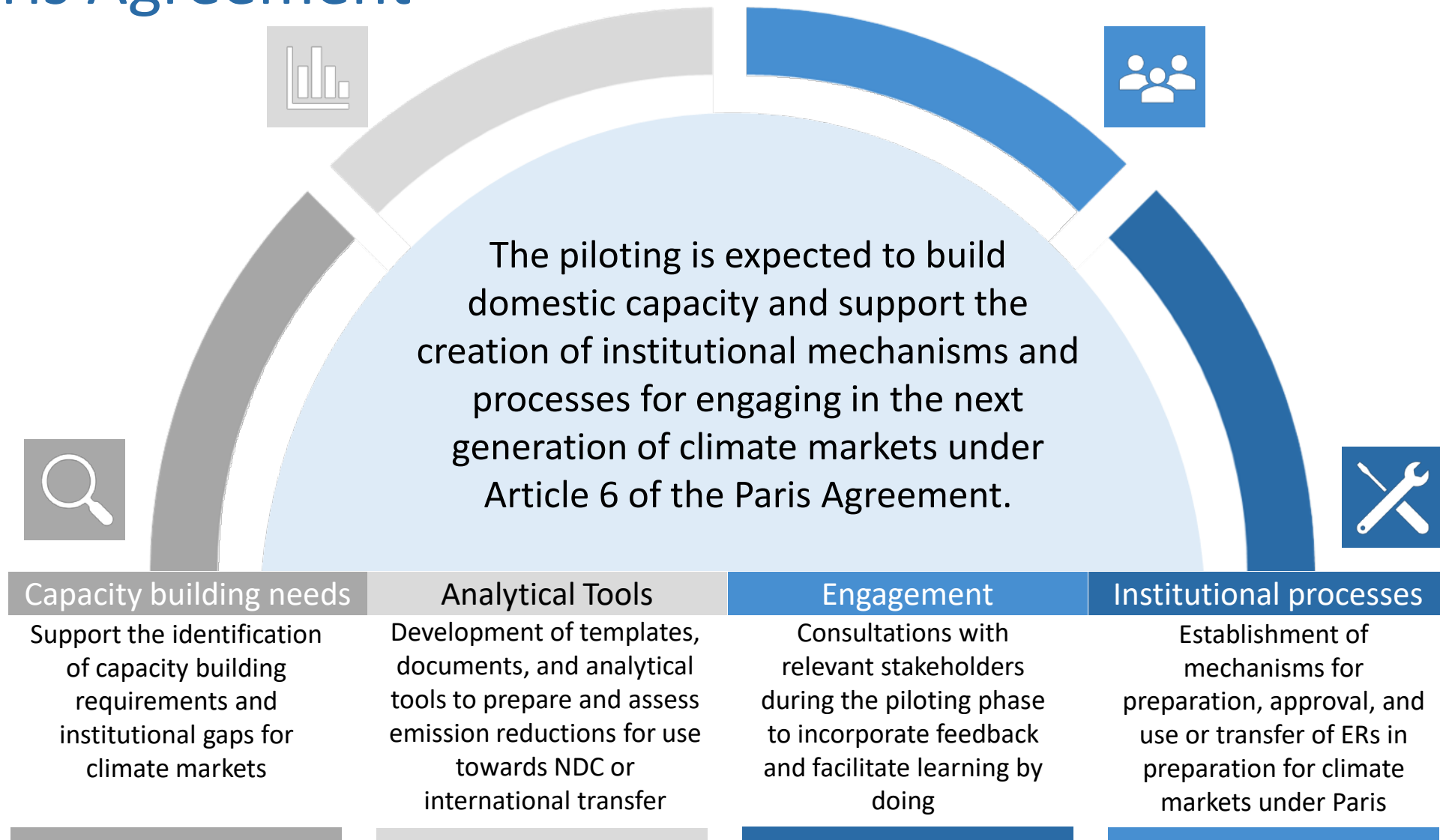
The World Bank will establish a transaction facility to facilitate demand for MOs



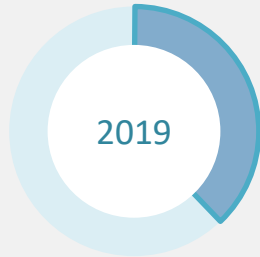
The pilots will be developed with feedback from stakeholders...



...and build readiness for climate markets under the Paris Agreement



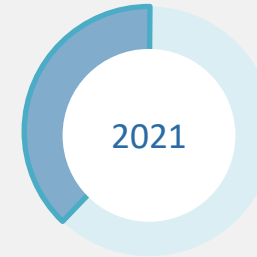
Timeline for implementation



- Pilot asset development from Bank operations
- Initiate conceptual design of country funds and warehouse
- Tools for comparability of mitigation actions
- Convene MDB Working Group and develop options paper



- Scale up asset development
- Complete design of country funds and blockchain registry pilot
- Develop financial products for specific transactions



- Deliver implementation-ready asset development, warehouse, and transaction facilities
- Support operations for implementation

Gradual Scaling up

EXTRA SLIDES

The WBG is developing programs and products to operationalize markets under Article 6



Asset Development Facility

Generate supply of MOs from the Bank's lending operations



Warehouse Facility

Provide infrastructure for standardized assessment, recording and transferring of MOs



Transaction Facility

Facilitate demand and transactions for MOs through the design of financial instruments and products



Generation of MOs from WB operations...

1 Definition

- Definition of the program's characteristics and relationship to the country's NDCs
- Definition of ownership rights/title of the MOs.



2 Methodology

Preparation of MOs under internationally accepted methodologies, and development of new methodologies where necessary.



3 MRV Systems

Establishment of suitable monitoring, reporting, and verification systems for the project.



4 Registry

Process for generation of the MOs and registration of the climate asset in a suitable registry.



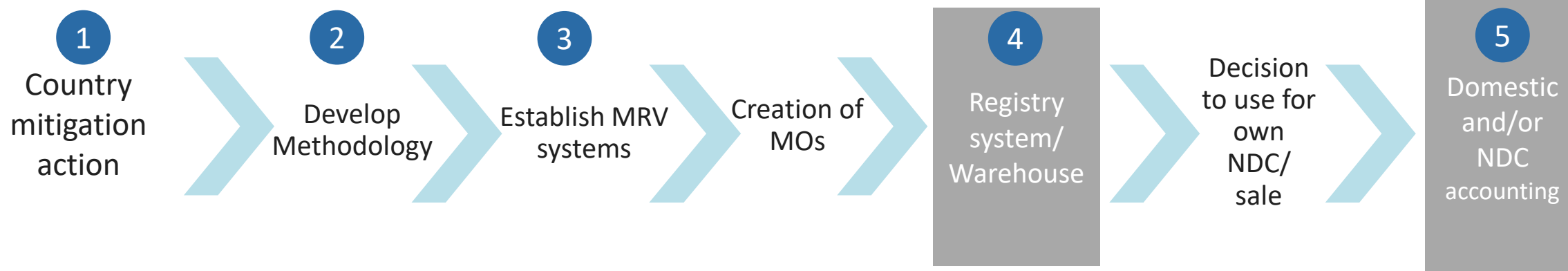
5 NDC Accounting



The MOs generated may be used by the host country towards its own NDC, or offered for sale to potential buyers. Consultation on and establishment of accounting process for MOs against NDCs for countries in which MOs are generated.

Generation of MOs from WB operations...

- The WB will initially focus on climate co-benefits generated from its own portfolio of lending operations
- The WB will develop this approach through a consensus-driven process with the **MDB Working Group on Article 6**, and collaboratively pilot the creation of MOs through **MDB operations with high mitigation potential**
- Country engagement is required at all stages of the MO generation process below. World Bank can provide technical support in stage 1-5.



The WBG is developing programs and products to operationalize markets under Article 6



Asset Development Facility

Generate supply of MOs from the Bank's lending operations



Warehouse Facility

Provide infrastructure for standardized assessment, recording and transferring of MOs



Transaction Facility

Facilitate demand and transactions for MOs through the design of financial instruments and products

Inform development of regulatory framework for Article 6
Develop common and efficient market infrastructure

A transparent inventory of available MOs

The Warehouse Facility will (building on the Asset Generation) manage MOs in cases where clients are interested in selling MOs. In the near future, buyers will be limited and prices are likely not to be attractive in comparison to the opportunity cost of generating the MO.

Warehouse climate assets

- Create and maintain a registry and for recording and tracking MOs
- Assess each MO entering the warehouse using the Mitigation Action Assessment Protocol (MAAP), allowing buyers to measure, compare and benchmark the relative performance and risks of the underlying climate actions and MOs
- Present a transparent inventory of the available MOs to potential buyers

Facilitating use of MOs

- Identify process/modalities for the use of MOs for NDC compliance by the generating Party (host country)
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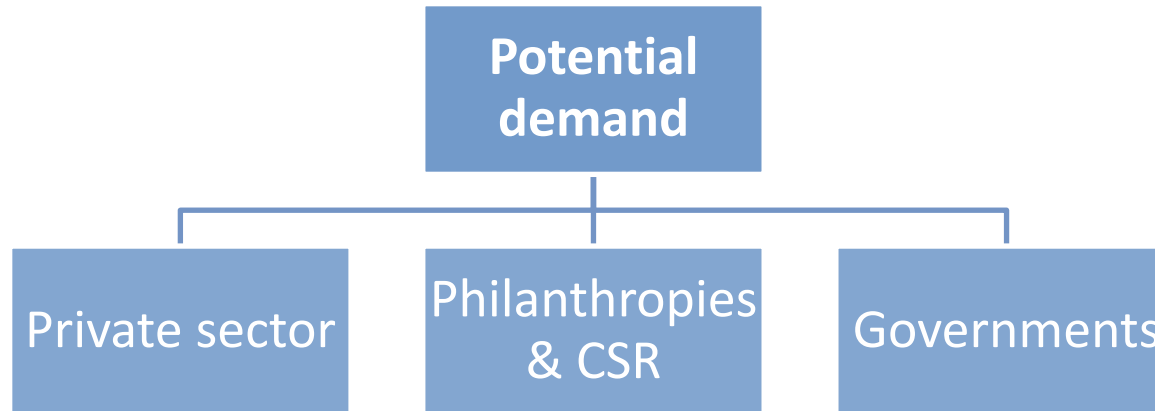


Transaction Facility

Facilitate demand and transactions for MOs through the design of financial instruments and products

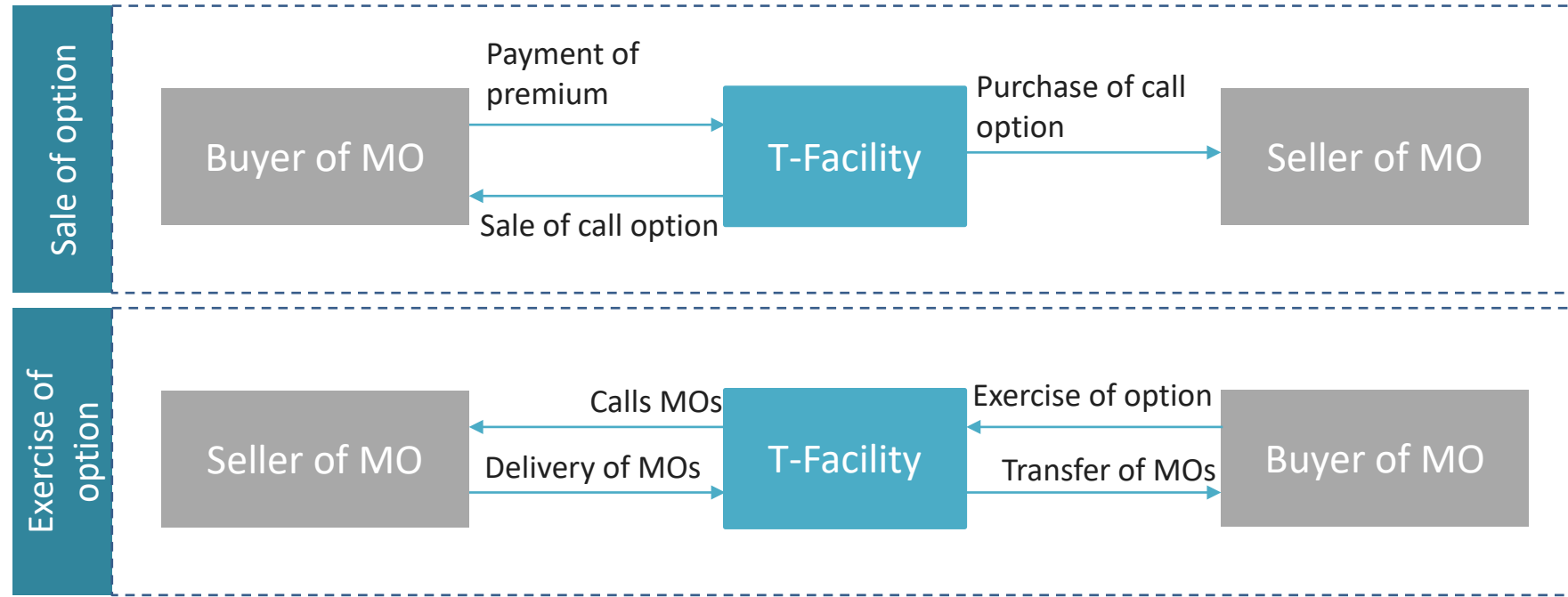
Inform development of regulatory framework for Article 6
Develop common and efficient market infrastructure

The transaction facility will develop innovative financial products to facilitate demand for MOs



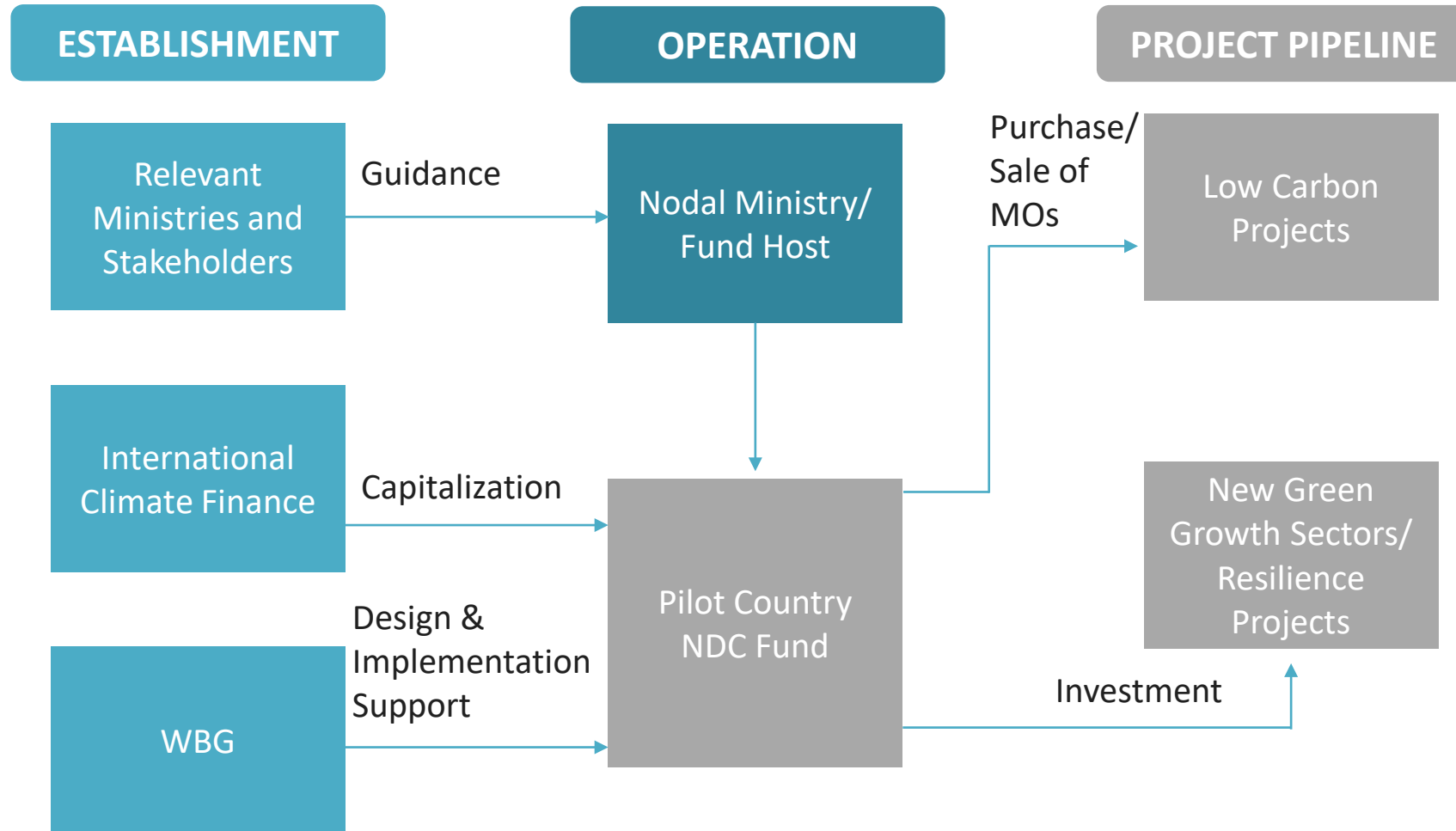
- Financial instruments are required to help manage market and financial risks
- These may include instruments to leverage additional capital (bonds), manage risks (guarantees, option contracts), or address other investor concerns
- A range of middle income client countries may create domestic climate markets to meet their NDCs. These markets will benefit from financial instruments and national funds, including existing buying facilities (e.g., TCAF)

Options Contracts

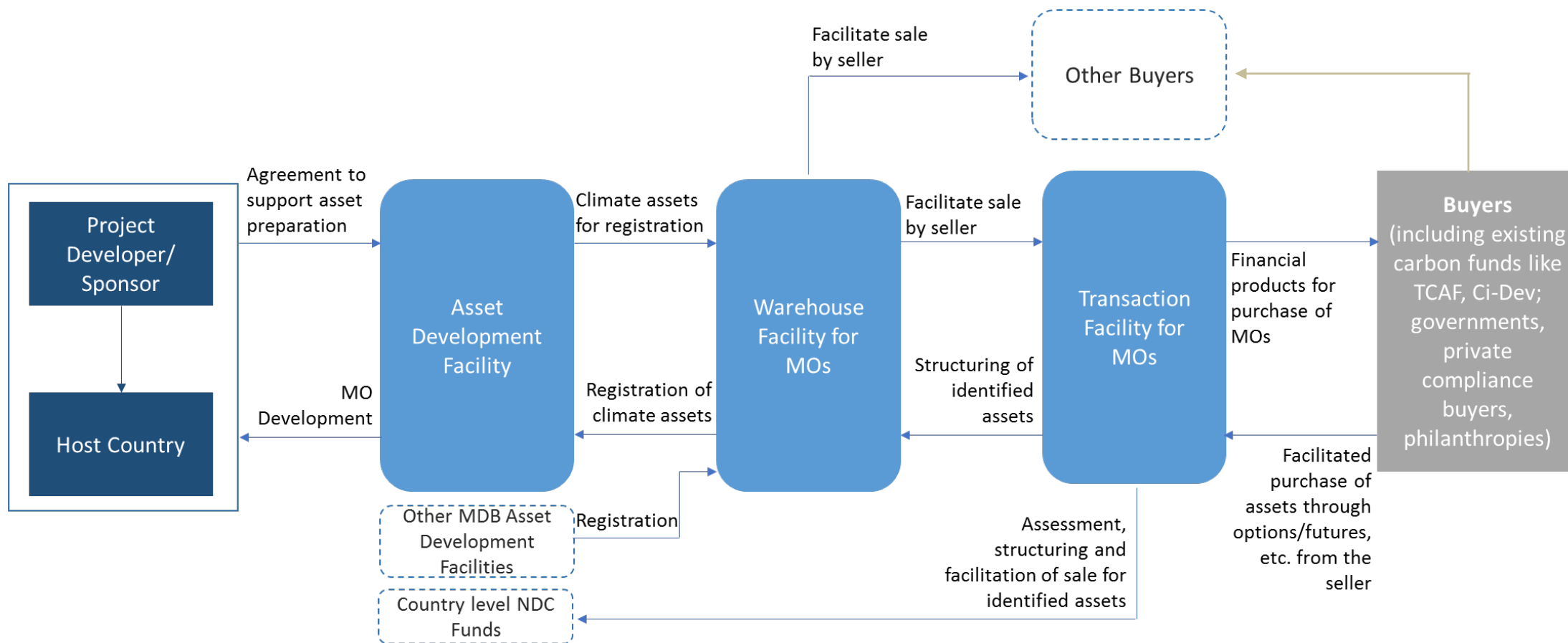


- T-Facility may issue a call option to a buyer of identified MOs at a [fixed/floating] price of MOs, exercisable by a specific date.
- T-Facility will also purchase a call option from the seller of the identified MOs.
- If the buyer exercises the call option, T-Facility will facilitate the delivery of the agreed amount of MOs to the Buyer.

Country-level funds will be established to build domestic capacity



Together, the facilities can provide a range of services



Seller Representation

Buyer Representation

The WBG is developing programs and products to operationalize markets under Article 6



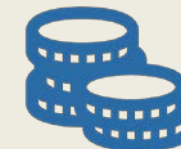
Asset Development Facility

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Facilitate demand and transactions for MOs through the design of financial instruments and products

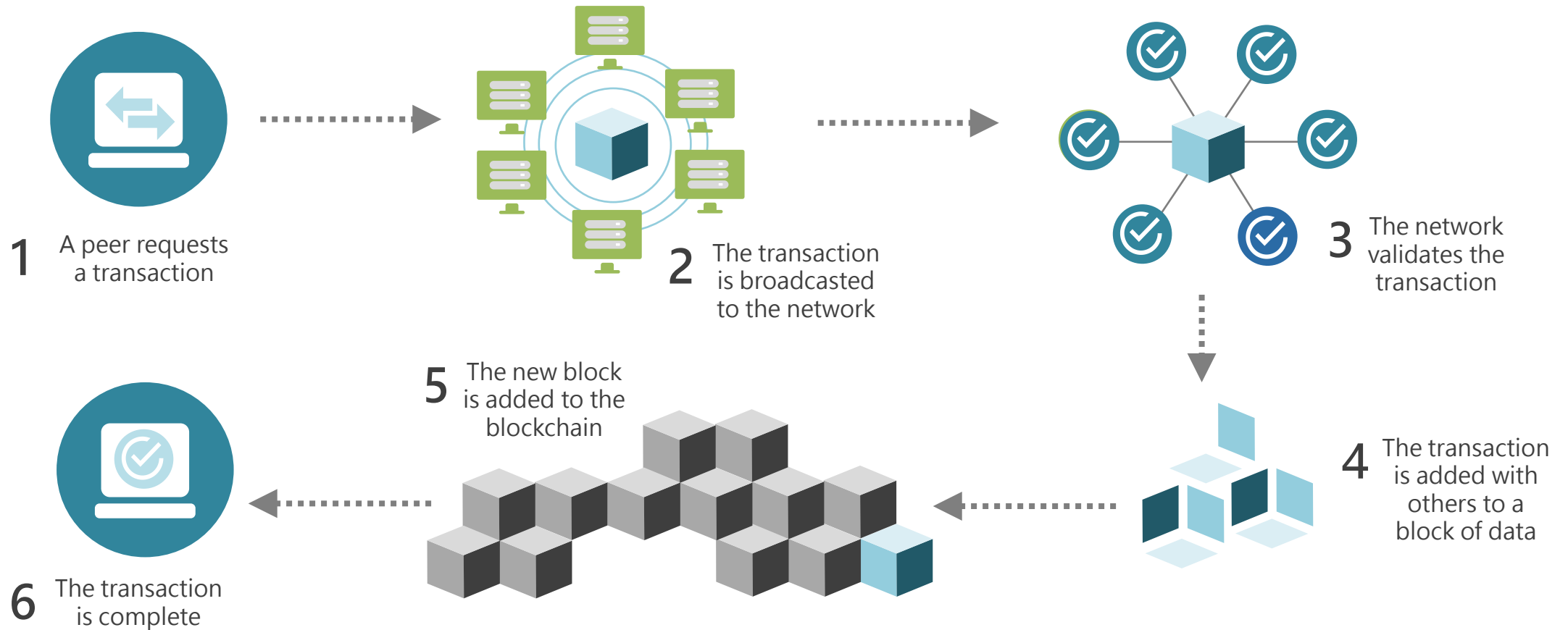
Inform development of regulatory framework for Article 6
Develop common and efficient market infrastructure

Identify areas of common understanding to inform UNFCCC process

Through the MDB Working Group, the WB and MDBs will carry out analytical work to inform and facilitate the development of a regulatory framework

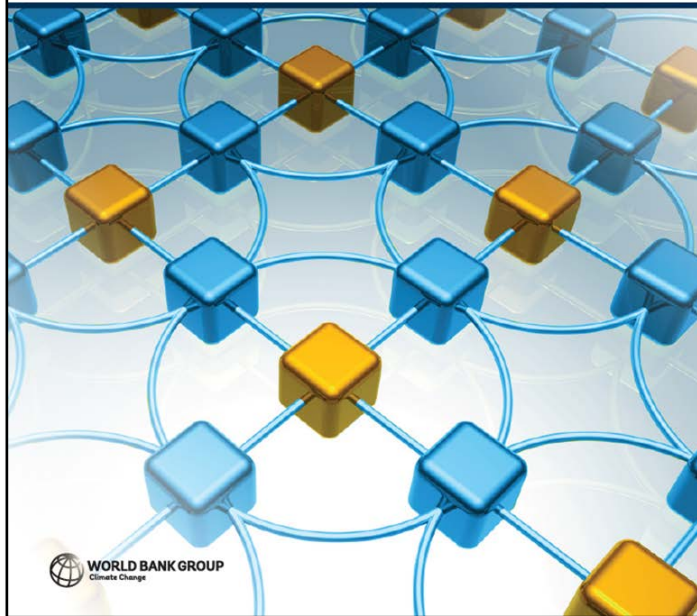
- Develop an options paper mapping modalities and procedures of different cooperative approaches on Article 6
- Enhance comparability of diverse mitigation outcomes:
 - Further develop the [Mitigation Action Assessment Protocol](#) to meet Article 6 requirements
 - Assess impact of mitigation actions under different levels of ambition through [Climate Transparency](#)
- Build market infrastructure for avoidance of double counting, corresponding adjustment and transparent tracking of sales and international transfers of mitigation outcomes

Distributed ledger technologies can be applied to climate markets



Benefits of using Distributed Ledger Technology

Blockchain and Emerging Digital Technologies for Enhancing Post-2020 Climate Markets



[Blockchain and emerging digital technologies for enhancing post-2020 climate markets](#)

DLT shows promise

- ✓ Climate assets can be digitized through a streamlined, efficient process
- ✓ Transparent generation and transfer of assets by users/validators
- ✓ Verification process is “automated”, and costs are reduced
- ✓ Distributed ledger offers security and reliability for users
- ✓ Transactions can be programmed through smart contracts

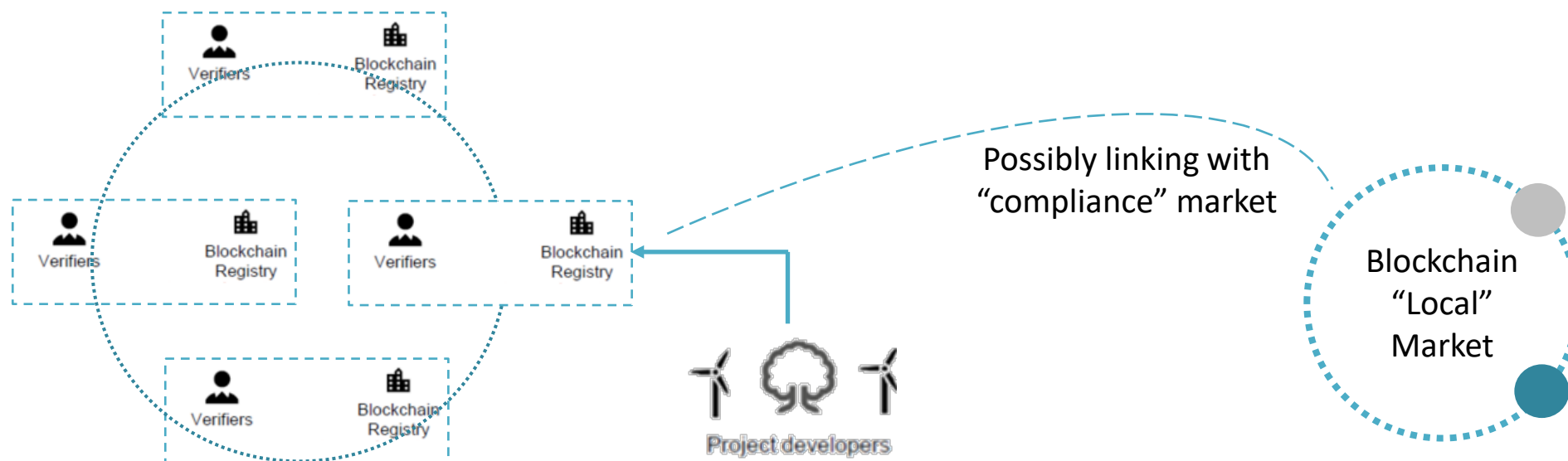
The WBG will design a proof of concept

The WBG's phased approach to proof of concept

1. Registries and trading

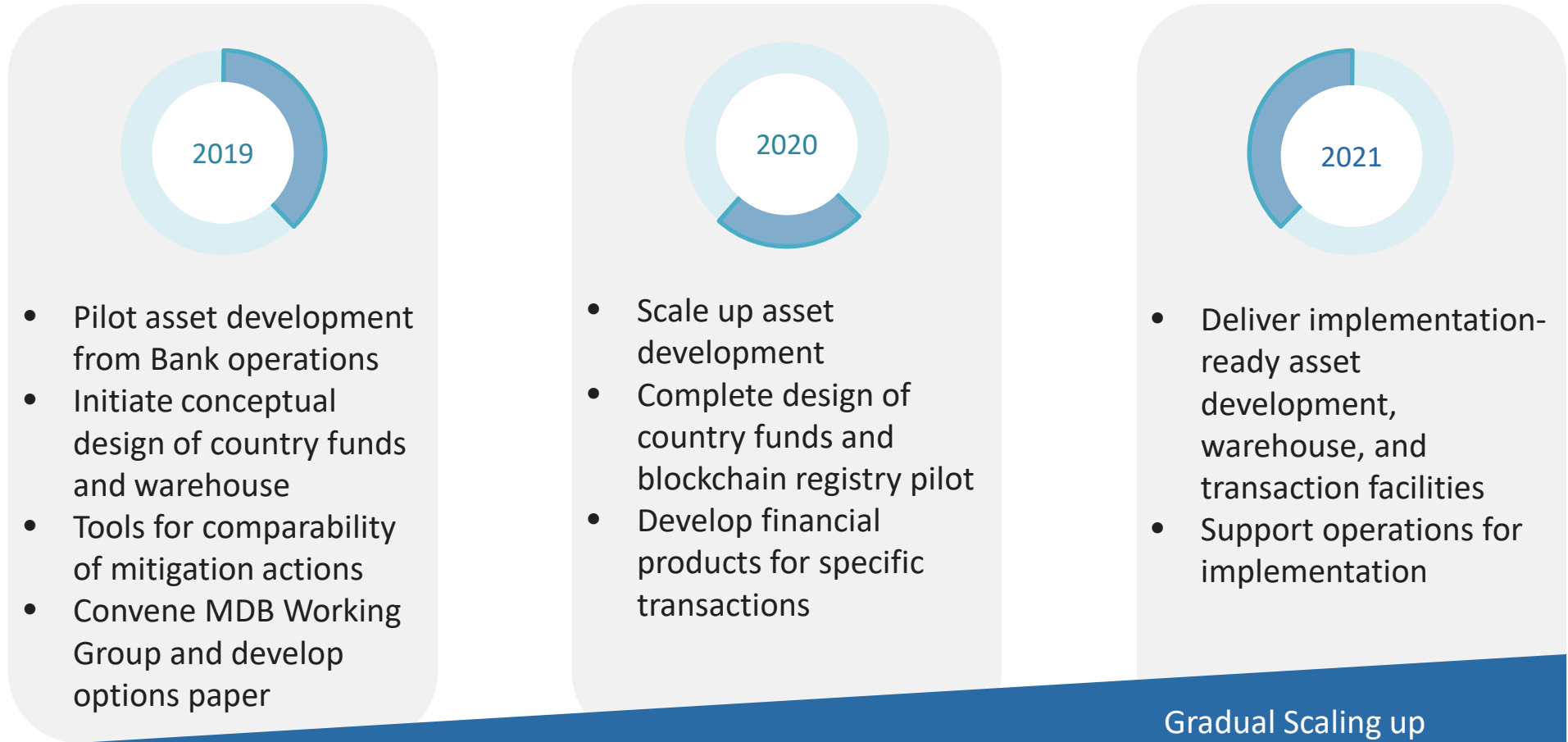
2. Asset generation and digitization

3. Individual Trading

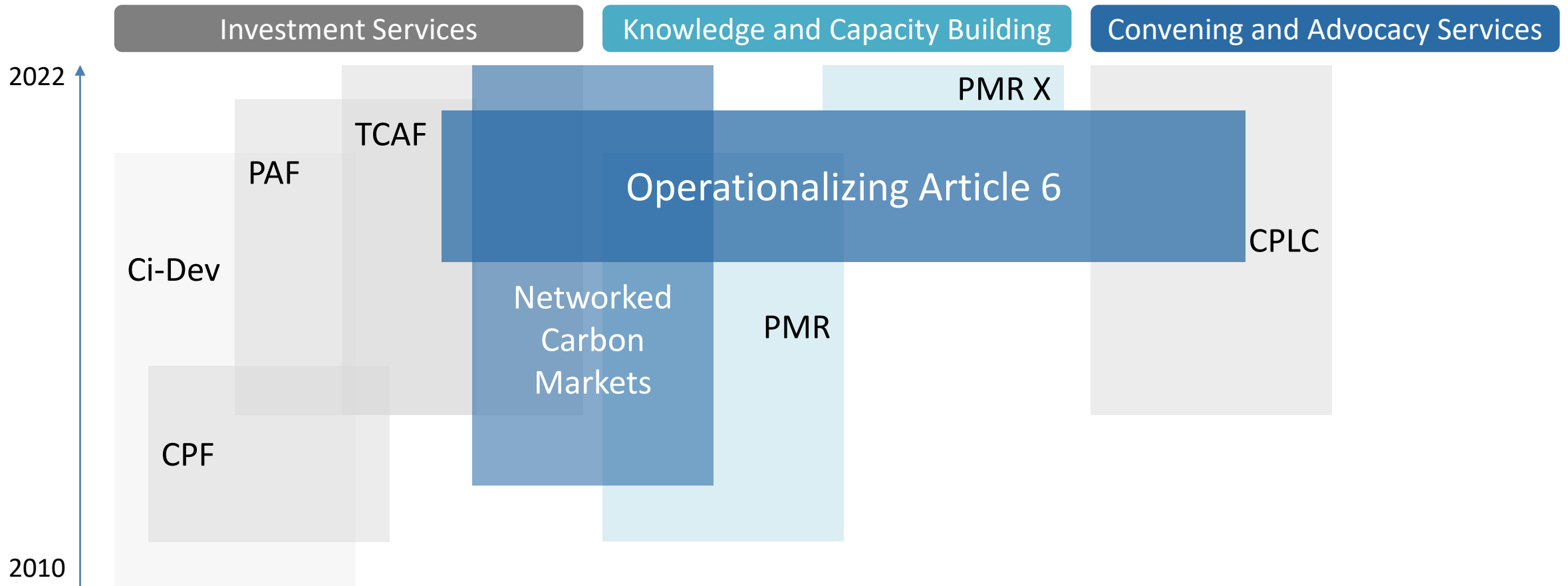


Timeline and Complementarity with Other Initiatives

Timeline for implementation for the whole program



Complementarity with the range of products, services and instruments addressing markets and carbon pricing



Stakeholder engagement

Client/Donor Governments

Engagement via World Bank Country Management Units and Global Practices

Private sector Philanthropies

International climate forums (e.g. Innovate4Climate, workshops)

Research institutions

International climate forums, workshops, joint knowledge products

MDBs

MDB Working Group (e.g. Article 6, climate finance, GHG methodology)

Co-design facilities and/or piloting MO transactions

Contact Us

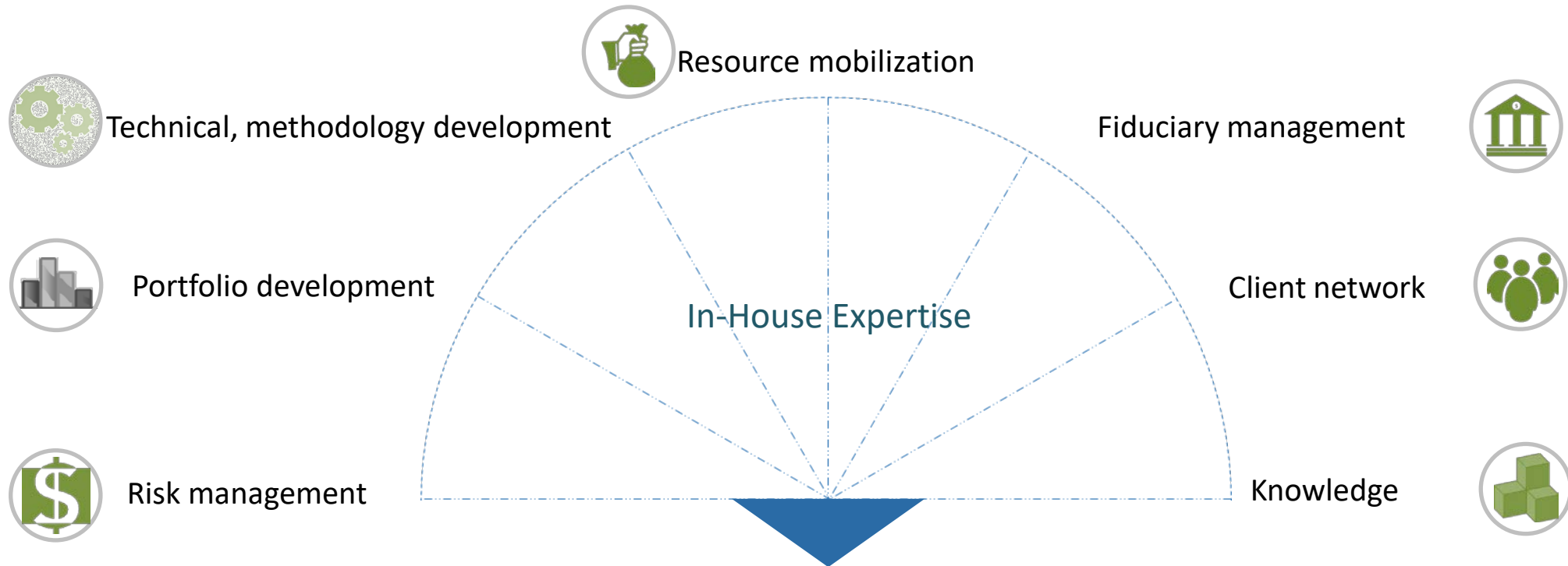
Carbon Markets and Innovation Team Climate Change Group

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Neeraj Prasad, Practice Manager, Carbon Markets and Innovation, nprasad@worldbank.org

Annex: WB CREDITIALS

WBG credentials and expertise on climate markets



Impact

The Prototype Carbon Fund (PCF) created in 2000 was the world's first carbon fund

- Total capitalization: US\$2.8 billion (of which 56% private capital)
- Investment leverage: 1:4 to 1:10
- CERs delivered: >200 million tCO₂e reduced
- Proportion of total global CERs: 12% (158 projects in 45 countries)




80% of CDM projects used at least one WBG-developed methodology

The World Bank's first generation of carbon funds




<p>April 2000</p>  <p>Prototype Carbon Fund</p> <p>World's First Global Carbon Fund</p> <p>\$220,000,000</p>	<p>May 2002</p>  <p>Netherlands Clean Development Mechanism Facility</p> <p>Pioneer purchaser of CDM</p> <p>**</p>	<p>March 2003</p>  <p>Community Development Carbon Fund</p> <p>Poorest country focused</p> <p>\$128,600,000</p>	<p>March 2004</p>  <p>Italian Carbon Fund</p> <p>Government & private sector</p> <p>\$155,600,000</p>	<p>May 2004</p>  <p>BioCarbon Fund Tranches I & II</p> <p>Afforestation, Reforestation, REDD+ & soil carbon</p> <p>\$90,400,000</p>
<p>August 2004</p>  <p>Netherlands European Carbon Facility</p> <p>Purchasing JI</p> <p>**</p>	<p>January 2005</p>  <p>Danish Carbon Fund</p> <p>Government & private sector</p> <p>€90,000,000</p>	<p>March 2005</p>  <p>Spanish Carbon Fund</p> <p>Government & private sector</p> <p>€220,000,000</p>	<p>August 2006</p>  <p>Umbrella Carbon Facility Tranches I & II</p> <p>Adding liquidity to market at key moments</p> <p>€904,100,000</p>	<p>March 2007</p>  <p>Carbon Fund for Europe</p> <p>Governments & private sector</p> <p>€50,000,000</p>

** Unpublished



Second generation (post-Kyoto Protocol) carbon funds (1/2)

WB Facility	Focus	Resources	Partners
 <p>CARBON PARTNERSHIP FACILITY</p>	Scaling-up carbon finance	\$165 million	7 selling country, 3 buying country and 2 donor participants
 <p>FOREST CARBON PARTNERSHIP FACILITY</p> <p><i>FCPF Carbon Fund</i></p>	Testing purchase of REDD+ credits	\$465 million	8 public and 2 private and 1 non-profit participants
 <p><i>BioCarbon Fund Tranche 3</i></p>	Financing for Sustainable Landscapes	\$308 million	Donor governments pledging results based finance for blended climate and development impacts; Structure under development for private sector

Second generation (post-Kyoto Protocol) carbon funds (2/2)

WB Facility	Focus	Resources	Partners
 <p>Ci-Dev CARBON INITIATIVE FOR DEVELOPMENT</p>	<p>Support low-income countries to benefit from carbon finance</p>	<p>\$127 million</p>	<p>3 donor governments aiming to sustain carbon market capacity and test results based finance frameworks</p>
 <p>TCAF TRANSFORMATIVE CARBON ASSET FACILITY</p>	<p>Support developing countries to increase mitigation ambition</p>	<p>\$500 million</p>	<p>5 donor governments and 1 non-profit participant</p>
 <p>PILOT AUCTION FACILITY</p>	<p>Demonstrate new, cost-effective climate finance mechanism that incentivizes private investment</p>	<p>\$100 million</p>	<p>4 donor governments and 1 non-profit participant</p>

Technical Assistance for carbon market readiness

WB Facility	Focus	Resources	Partners	Program
	<p>Capacity building to support market based tools for GHG reduction</p>	<p>\$127 million</p>	<p>29 country participants including 12 donor governments</p>	<ul style="list-style-type: none"> • Supporting countries' development of readiness component for market instruments • Helping developing countries explore, pilot and test emissions trading • Building on country priorities for low-carbon growth
 <p><i>FCPF Readiness Fund</i></p>	<p>National & sub-national REDD+ pioneer</p>	<p>\$360 million</p>	<p>65 participants including 18 donor governments</p>	<ul style="list-style-type: none"> • Guiding readiness and carbon finance for REDD+ • Forging partnerships between developed and developing countries • Enhancing capacity building and technical assistance

Private sector partners in carbon funds



Public sector partners in carbon funds



AUSTRIA



FINLAND



JAPAN



SPAIN



AUSTRALIA



AGENCE FRANÇAISE DE DÉVELOPPEMENT



JAPAN INTERNATIONAL COOPERATION AGENCY



SWEDEN



REGIONAL GOVERNMENTS OF BRUSSELS-CAPITAL, FLEMISH AND WALLOON REGIONS



GERMANY



LUXEMBOURG



SWITZERLAND



NETHERLANDS



DENMARK



IRELAND



NORWAY



THE UNITED KINGDOM



THE EUROPEAN COMMISSION



ITALY



PORTUGAL



THE UNITED STATES

The World Bank Group credentials in creating markets



- \$8.3B provides 72 countries with resources to manage climate change challenges and reduce GHG emissions
- Focus on energy, climate resilience, transport and forestry sectors
- Expected to attract \$58B of co-financing
- Public finance leverages private climate investments



- Green building certification system for emerging markets created by IFC
- Fast and inexpensive certification
- Provides measureable standards for builders to optimize their designs, leading to more investment-worthy and marketable products

World Bank Green Bonds



- IBRD & IFC issue debt securities to raise capital specifically to support climate-related or environmental projects
- IBRD has issued \$9.1 billion (as of June 2016) and IFC has issued \$5.6 billion (as of Sept. 2016) in green bonds
- Standardized financial instruments help investors to understand and access well-vetted climate investments

Scaling Solar



- Brings together a suite of WBG services under a single engagement aimed at creating viable markets for solar power in each client country
- Provides standardized processes and templates for tendering, legal and project documents. Offers financing, insurance, risk management, and credit enhancement