Ministry of Science and ICT

NATIONAL INSTITUTE OF GREEN TECHNOLOGY

K-CTDP

Korea Climate Technology Demonstration Program (R&D)

Hanna Kang (Dr. rer. nat.)

Senior researcher

National Climate Technology Cooperation Center

National Institute of Green Technology (NIGT)

Introduction

Korea Climate Technology Demonstration Program

Government-funded R&D initiative

Ministry of Science and ICT

Lead Agency

- Oversees science & technology (Korea)
- Promoting climate mitigation technologies
- Key domains: renewables, hydrogen, CCU

Korean research institutions

Proven technical expertise

- Validated capabilities in key domains
- Seeking real-world demonstration

Structured partnership with MDBs & development organizations

Founded on complementarity: MDB technical challenges ⟷ Korean R&D expertise

K-CTDP aims: Match MDB project challenges with Korean R&D demonstration needs

Address climate issues

in developing countries
Real-world field deployment

Advance technological innovation

Validate & refine technologies
Diverse demonstration environments

Scale-up through MDB lending project pipeline

Demonstrated technologies feed into the MDB project pipeline for wider adoption

01 Objectives & Scope

- Demonstrate proven Korean climate technologies (GHG mitigation and adaptation solutions at TRL 5–6) through pilot deployments in developing countries, validating technical performance and local adaptability in developing country conditions, substantiating bankability to unlock financing, and building internationally recognized project track records for future scaling.
- Focus on small-and medium-scale pilot projects in Korea's 17 key carbon-neutrality technology areas (e.g., renewable energy and hydrogen, BECCUS, AI-enabled climate disaster and forest management systems, and eco-friendly mobility solutions).
- Leverage pilot outcomes to design and finance large-scale follow-on projects in partnership with IFIs, MDBs, UN agencies, ODA programs, and private investors – accelerating the global deployment of Korean climate technologies while enhancing developing countries' carbon neutrality pathways and climate resilience.

02 Lead Ministry

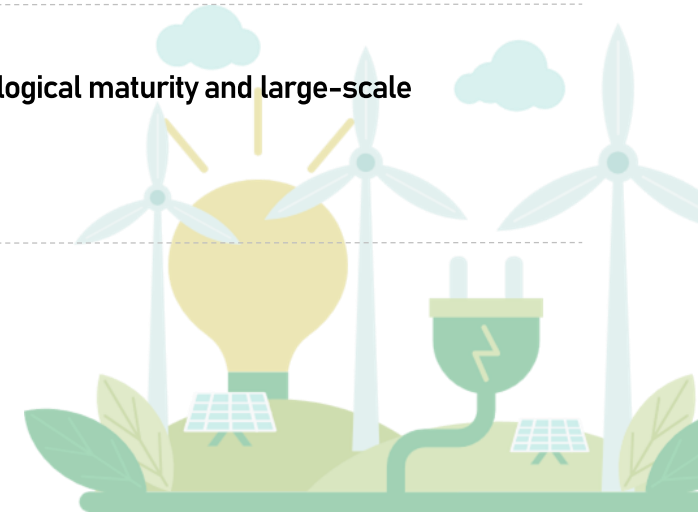
- MSIT (Ministry of Science & ICT) of Korea – Providing overall policy direction and strategic oversight, approving the program framework, budget allocation and annual work plans

03 Executing Entity

- Consortia led by Korean R&D institutes, joined by Korean private technology firms possessing proven technological maturity and large-scale commercialization capabilities.

04 Budget & Period

- Budget per pilot project: Up to USD 1.7 million (KRW 2.4 billion)
- Project implementation period: 18 months (July of year 1 to December of year 2)



Notification

1

PROGRAM NATURE

This is an R&D project.

Research outcomes, facilities, and technologies from Korea's pilot program belong to Korean institutions. Use, transfer, or lease requires consultation between Korean institutions and local/MDB partners.

2

COOPERATION FOCUS

A research and innovation partnership.

The cooperation identifies areas of practical technological suitability, generates evidence, and disseminates results.

3

BUDGET FLOW

The budget is disbursed to and executed by Korean R&D institutions.

Funding flows directly to Korean research institutions responsible for carrying out the demonstration activities.

05 Key Activities

Year 1 — Local Adaptation, Design & Installation (Preparation Phase)

- **Demonstration preparation and site assessment** Conduct local environmental surveys, stakeholder consultations, and finalize prototype and demonstration facility specifications.
- **Local adaptation design and manufacturing** Adapt technology and components to developing country conditions; design, manufacture, factory-test, and transport demonstration systems.
- **On-site installation and commissioning** Install locally adapted demonstration systems and complete initial commissioning and trial operation.

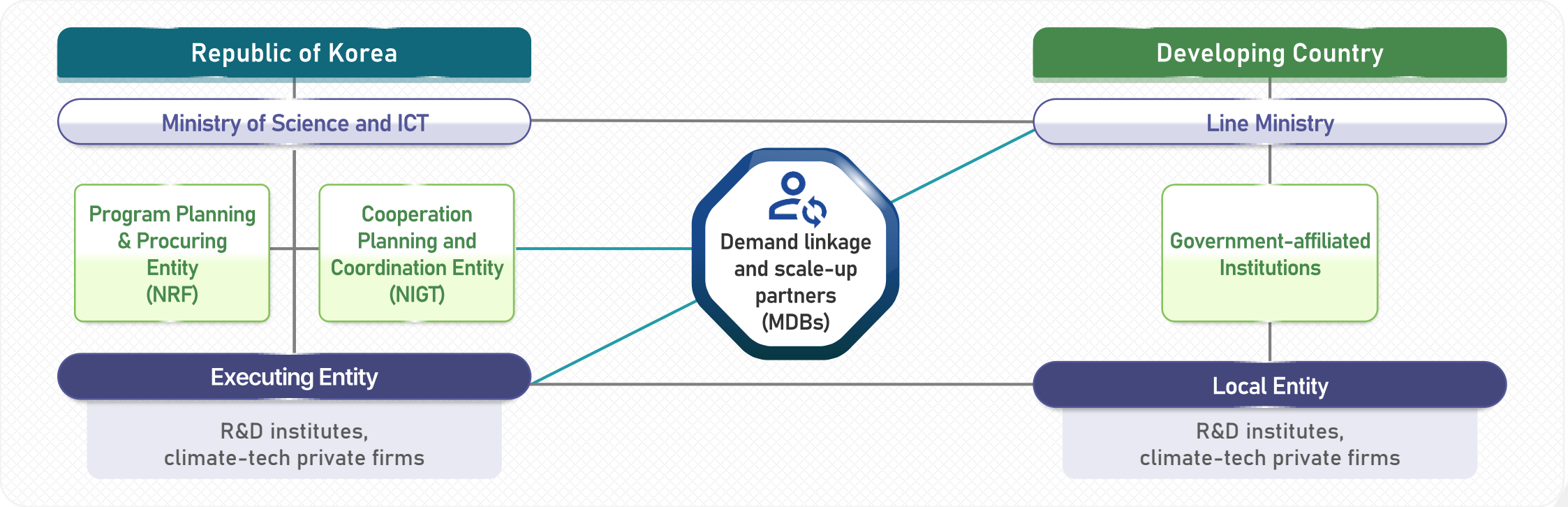
Year 2 — Operation, Performance Validation, and Scale-up Preparation

- **Full-scale demonstration operation** Operate demonstration facilities under real local conditions, implement real-time monitoring, and apply technical improvements as needed.
- **Technical performance validation** Analyze demonstration results, monitor performance indicators, and conduct MRV of GHG mitigation and adaptation benefits.
- **Stakeholder technical training** Deliver training programs for local operators and stakeholders on technology operation, maintenance, and management of demonstration facilities.
- **Commercialization and viability assessment** Evaluate local technology acceptance, economic and financial feasibility, environmental and social impacts, and overall bankability.
- **Follow-on project pipeline development** Identify technology transfer and scale-up pathways, hold consultations with local institutions and international partners, and prepare full-scale project proposals and financing packages.

06 Expected Outcomes

- ☑ **Technology Deployment** Enhanced deployment of Korea's priority climate technologies in developing countries.
- ☑ **Track Record & De-risking** Established portfolio of internationally recognized, locally validated demonstration track records.
- ☑ **Scale-up Pipeline & Commercial Replication** Catalyzed pipeline of large-scale follow-on projects and commercial replication.

07 Cooperation Platform



* NRF : National Research Foundation of Korea (www.nrf.re.kr)
* NIGT : National Institution of Green Technology (www.nigt.re.kr)

08 Timeline

Year 0	April to May	Technology needs identification from Korean research institutions & MDBs
	Jun to Sep	Matching of Korean technologies to MDB project needs and screening
Year 1	Oct - Jan	Development of Request for Proposals (RFPs) for short-listed candidates
	Feb	Identification of short-listed candidate projects by MSIT & Procuring Entity
	Mar to Jun	Competitive Call for Proposals by the Procuring Entity
	June	Selection of the final projects and Executing Entities
Year 2	Project Implementation for 18 months July	Project commencement by the Executing Entities
	Dec	Project completion and final evaluation

*The above schedule is subject to change depending on circumstances.

09 Demonstration Projects for 2026

	1 MONGOLIA	2 TANZANIA	3 KYRGYZSTAN
	National-Level ESS Central Dispatch System for Grid Stabilization	AI-Based Extreme Climate-Adaptive Railway Safety Control	AI-Based Dairy Livestock Methane Emission Estimation Model
OBJECTIVE	Demonstrate ACE-based AGC technology for large-scale transmission-level ESS to address grid inertia decline from expanding renewables, demonstrated at Mongolia's NDC live grid.	Advance smart detection, early warning & active response for railways through in-country demonstration in Tanzania and establish official track record for global infrastructure markets.	Develop an AI model for estimating methane emissions using local dairy livestock biometric & nutritional data in Kyrgyzstan and establish data-driven methane reduction strategies.
KEY ACTIVITIES	ACE-based AGC algorithm for large-scale ESS Transmission-level ESS dispatch integration Live demonstration at Mongolia NDC center Automated frequency response & monitoring	AI smart sensing for extreme weather events Real-time early warning for railway hazards Active response & automated safety control Linkage with international infrastructure programs	Local dairy biometric/nutritional data analysis AI model training for methane estimation Validation against Kyrgyz field measurements Evidence-based methane reduction strategies
OUTCOMES	• National ESS AGC system deployed • Grid stability under high renewables • Scalable model for Central Asian markets	• Climate-resilient AI safety system validated • Official track record for global project bids • Exportable platform for Sub-Saharan Africa	• Localized AI methane estimation model • Methane reduction policy framework • Contributing to NDC climate targets

Proven in Korea.

Validated globally.

From R&D to real-world impact.