



KGID
2026
SEJONG

Climate Finance Session

From Lab to Carbon Market

How Technology Demonstration Bridges Climate Innovation and Finance

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CARBON MARKET MECHANISM

Carbon markets are the engine of climate technology innovation



Porter Hypothesis: The stronger the carbon regulation, the greater the technology innovation effect

(EU-ETS Phase 2 evidence, Energy Economics 2022)

EU-ETS Effect

EU carbon regulation clearly redirected firm R&D toward low-carbon technology; effect was strongest under stricter regulation.
(European Univ. Institute, 2021)

China ETS Effect

ETS pilot regions filed significantly more high-quality green patents and improved firms' access to finance.
(Energy Economics, 2022)

Win-Win Outcome

Carbon pricing cut emissions AND raised productivity simultaneously; drove fundamental strategy changes.
(J. Environmental Management, 2021)

WHY NOW?

The global carbon market window is open — and accelerating

① Article 6 is Now Operational

COP29
2024

Paris Agreement Article 6.4 rules were finalized at COP29 (2024), creating a fully functional international carbon credit trading mechanism for the first time.

③ Voluntary Carbon Market Surging

15×
by 2030

The global VCM is projected to grow 15-fold by 2030 (TSVCM/McKinsey). Demand for high-quality, verified credits is already outpacing supply.

② EU CBAM Creates Urgent Demand

2026
Full Force

The EU Carbon Border Adjustment Mechanism enters full implementation in 2026, making verified carbon pricing a prerequisite for market access — not an option.

④ Carbon Pricing Coverage Expanding

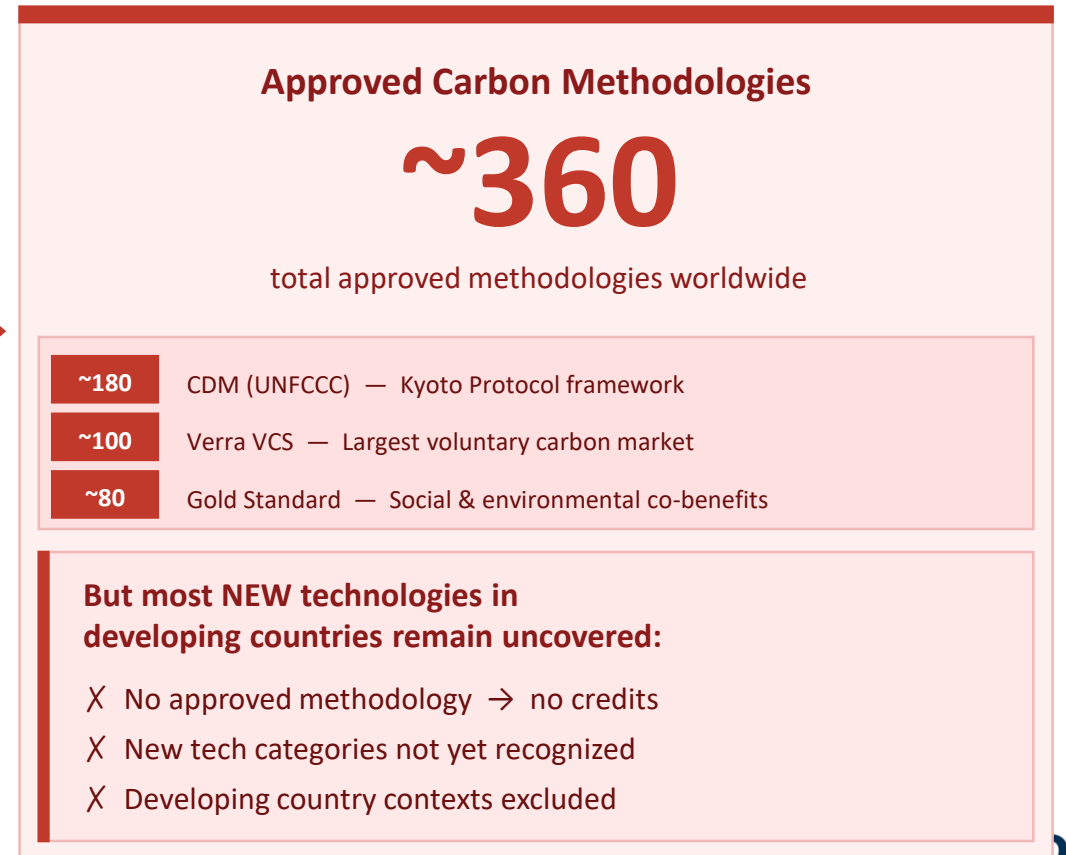
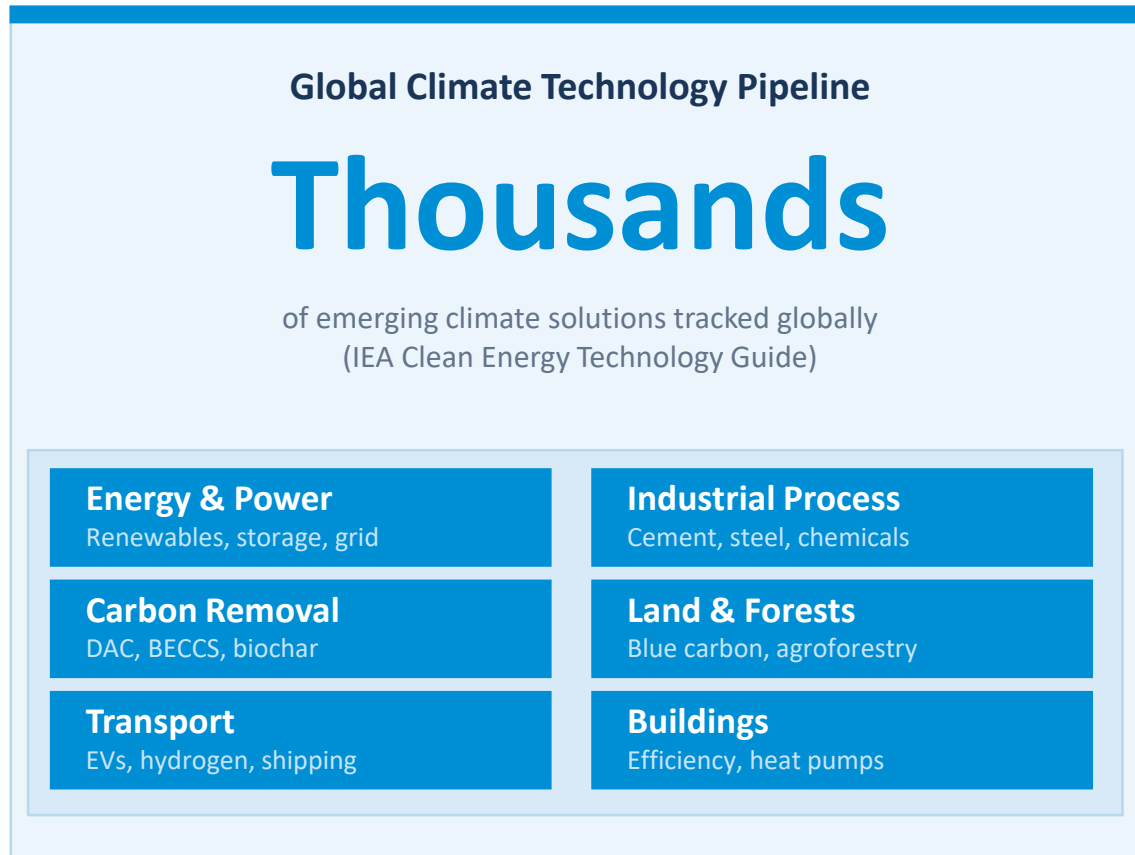
24%
of
Emissions

73+ carbon pricing instruments now cover 24% of global GHG emissions (World Bank 2024) — with developing nations rapidly joining the system.

The convergence of these forces creates an unprecedented window for climate technology investment — but only for technologies that can demonstrate results.

THE DEMONSTRATION GAP

A vast climate technology pipeline — yet most of it has no pathway to carbon markets



The bottleneck is not innovation — it is demonstration. Without field-verified data, no methodology applies and no credits can be issued.

WHY DEMONSTRATION FAILS TO HAPPEN

The Structural Barriers That Keep Technology Out of Carbon Markets

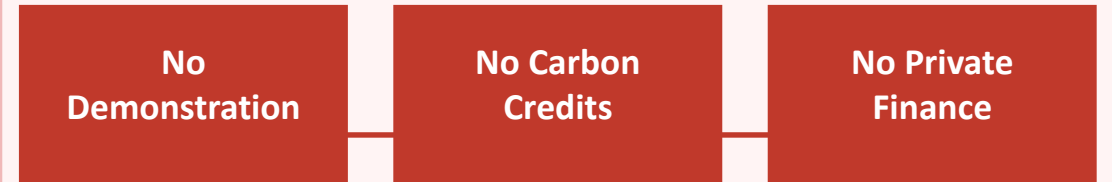
① Demonstration Costs Are Prohibitively High

Field demonstration is expensive — particularly for technologies applied in developing countries, where local conditions add uncertainty, regulatory frameworks are still evolving, and upfront capital is scarce. This creates a financing gap that private investors alone cannot bridge.

② MRV Requirements Are Non-Negotiable

Carbon markets require Measurement, Reporting, and Verification (MRV) data before any credit can be issued. This is not optional — it is the foundational standard of every credible carbon market, from the Kyoto to Article 6 mechanisms.

The Consequence Chain



The Missing Link

Technology demonstration is the bridge between climate innovation and carbon market access — yet it remains systematically underfunded. Bridging this gap is where public finance must act first.

Without demonstration data, climate technology cannot enter carbon markets

The Missing Link

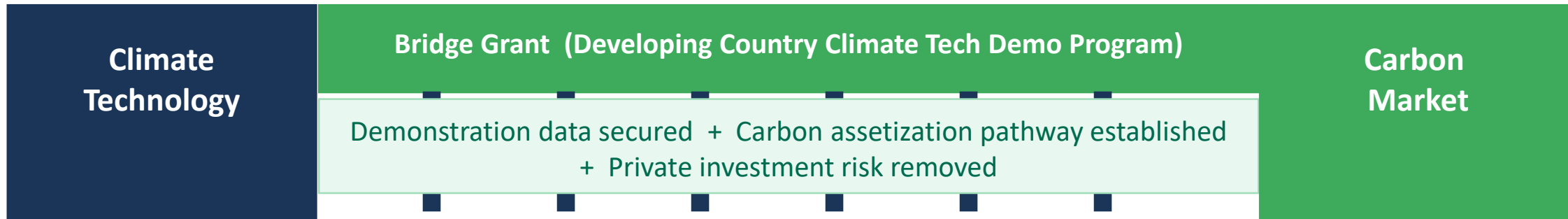
Technology Demonstration: The Gate to Carbon Markets

BRIDGING THE GAP: A PUBLIC FINANCE APPROACH

Korea Climate Technology Demonstration Program for developing countries

Ministry of Science and ICT, Republic of Korea

The Bridge Grant Model



01 Public Finance De-risks Entry

Absorbs demonstration costs before private capital is required to enter

02 Demonstration Data for Carbon Assetization

Field demonstration generates verified, site-specific data — the foundation for carbon credit issuance and carbon asset creation

03 Catalyzes Private Finance

Demonstrated technology = low-risk, investment-grade climate asset

INVESTMENT OPPORTUNITY

Carbon market growth creates tangible technology investment opportunities

\$50B+

Global voluntary carbon market potential by 2030

UNEP / World Bank 2024

40-60%

Climate target cost savings potential

UNEP Carbon Markets Report

Art.6

Paris Agreement international carbon market gateway for developing nations

Paris Agreement

Blended Finance Structure — Public Grants Catalyze Private Climate Investment

Dedicated Demo Fund

Technology Demonstration

Carbon Assetization

Private Climate Finance Inflow

Dedicated Demo Fund = a verified Carbon Assetization pipeline — and a low-risk Climate Finance entry point for investors and MDBs

Demonstration is the Bridge

*"Good technology without demonstration is invisible to the market.
What Climate innovation needs most is a dedicated demonstration fund."*

1 Invest in Demonstrated Tech

Prioritize investment in portfolio of demonstration-completed technologies

2 Leverage the Pipeline

Use demonstration fund as a Climate Finance entry pipeline into new markets

3 Co-finance & Scale

Design Blended Finance structures with MDBs and the World Bank

Technology → Demonstration → Carbon Asset → Private Finance

Research confirming the carbon market — technology innovation linkage

EU ETS Survey (European University Institute, 2021)

EU-ETS clearly redirected firm R&D toward low-carbon technology; effect was strongest under strict regulation.

J. Environmental Management (2021)

Carbon pricing cut emissions AND improved productivity (Win-Win); drove fundamental business strategy changes. (Quebec, Canada)

Climate Policy (2018)

Innovation reduces credit supply, raising price expectations — creating a virtuous cycle of private R&D investment.

Energy Economics (2022)

China ETS pilot regions showed significantly more green patent filings and improved firms' access to capital.

Korea Environmental Policy Institute (2019)

K-ETS participants showed higher R&D investment vs. non-participants, but green patent linkage remains limited at early stage.

World Bank — State & Trends of Carbon Pricing 2024

Carbon markets are central to financing climate action in developing countries. Paris Art.6 enables efficient cross-border investment flows.

Thank you