WORLD BANK GROUP | KOREA GREEN GROWTH TRUST FUND

PARTNERSHIPS FOR IMPACT SERIES

GREEN TECHNOLOGY SOLUTIONS

NATIONAL INSTITUTE OF GREEN TECHNOLOGY

How KGGTF Fosters Green Growth through Partnerships

The Korea Green Growth Trust Fund (KGGTF) is more than a funding mechanism. It is a catalyst connecting World Bank teams with Korean institutions that offer transformative solutions in sustainable development. KGGTF supports policy dialogue, study tours, and global learning exchanges that empower countries to scale climate-smart, inclusive, and green growth strategies.

This series highlights partnerships that deliver impact on the ground. Here we spotlight the National Institute of Green Technology (NIGT), a vital knowledge partner helping to breed policy innovation to advance climate technology.

National Institute of Green Technology (NIGT)

NATIONAL INSTITUTE OF GREEN TECHNOLOGY

1. ABOUT NIGT: KOREA'S THINK-TANK TACKLING CLIMATE CRISIS

Established in 2013, the National Institute of Green Technology (NIGT) is South Korea's government-funded research hub dedicated for climate technology policy development and global green technology cooperation.

Guiding Climate Innovation Policy

NIGT leads Korea's national strategy on green technology, crafting long-term R&D roadmaps and policy frameworks. NIGT's research such as market analysis, technology forecasting, and GHG modeling feeds into evidence-based planning of Korea's ministries and public agencies.

Catalyzing Green Technology Innovation

NIGT launched the Climate Technology Information System (CTis) to serve government agencies, private sector and development partners promote green technology innovation. It provides up-to-date data, trends, R&D outcomes, and international cooperation initiatives related to climate technologies to ensure transparency and promote global project matchmaking.

Creating Standards for Climate Technology

NIGT is steering analytical work to provide clarity for policy makers and funders globally. Together with UNFCCC, NIGT developed the Adaptive Technology Classification System (ATCS) which offers a unified structure for identifying and tracking adaptation technology.

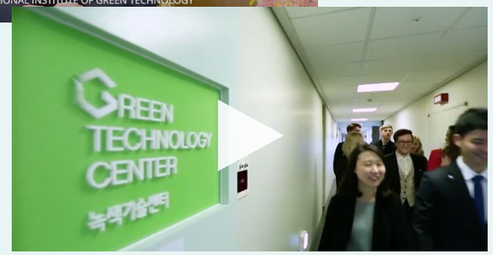
Strategic Partnership for Global Impact

NIGT plays a key role in international collaboration in climate technology policy and innovation. It serves as the technical advisor to the National Designated Entity (NDE) representing the Republic of Korea in UNFCCC technology negotiations and the Technology Executive Committee (TEC). As a member of the Climate Technology Centre and Network (CTCN), NIGT provides technical assistance to requesting governments, supporting their climate-resilient and low-carbon sustainable development. NIGT also collaborates dozens of international organizations and global institutes like World Bank, ADB, SEI and Wuppertal Institute to deliver joint research, expert consultations, and policy advisory services.

Interview of NIGT President Sanghyup Lee

The National Institute of Green Technology (NIGT) was established with international cooperation as one its core purposes.

—Sang Hyup Lee, National Institute of Green Technology (NIGT) President



Watch how NIGT is bringing green technology know-how to other countries.

Foundation Purpose and Management Philosophy

Mission and Legal Foundation

Support for green technology R&D policy development and international collaboration

Article 32-2 of the Charter of the Korea Institute of Science and Technology(Affiliated Institutes)

Key Functions and Roles

Policy Data Production
- Analyze and produce the data and statistics of technologies
- Establish and operate integrated data platforms

National R&D Policy Planning
- Develop national R&D strategies and project planning
- Propose legislative and institutional improvement plans

Global Cooperation Strategies
- Establish full-cycle collaboration & tech support systems
- Develop model for overseas dissemination of domestic tech

HRD Policy Management
- Develop national policies for climate tech HR development
- Plan & implement workforce programs for universities, SMEs, and stakeholders

2. KEY AREAS OF COLLABORATION WITH THE WORLD BANK

NIGT has partnered with the World Bank across a wide range of sectors, including transportation, energy, land restoration, and digital development, bringing deep technical expertise and a proven track record grounded in Korea's own development experience. Drawing from Korea's successful transition to a green and innovation-driven economy, NIGT has supported the design of low-carbon mobility strategies, renewable energy roadmaps, sustainable land management approaches, and digital infrastructure systems in client countries. Building on this strong foundation, there is significant potential to expand collaboration into emerging priority areas such as carbon capture and storage, integrated waste management, environmental pollution control, and energy efficiency. By leveraging its multidisciplinary capabilities and Korea's policy and technology insights, NIGT can continue to help countries pursue green growth, enhance resilience, and tap into climate finance opportunities.

Policy and Strategy Support

A cornerstone of NIGT's contribution has been its policy advisory and strategic planning support. By offering analytical tools and forward-looking policy guidance, NIGT helps partner countries and World Bank teams design actionable green transition pathways. These efforts are grounded in Korea's own development experience and are tailored to support country-specific needs and institutional capacities.

- Decision-making tools for climate technology deployment
- Roadmap and strategy development for green technology implementation
- Developing funding plans for the technology deployment

Technical Assessments

NIGT provides technical expertise to identify, assess, and recommend context-appropriate green technologies. These assessments serve as a foundation for the design and planning of upstream initiatives that may lead to future investments by public institutions, international organizations, or other financing entities. They help ensure that interventions are not only technologically viable but also socially and environmentally impactful. Technical work includes understanding local constraints, evaluating potential emissions reductions, and identifying gaps that must be addressed to ensure successful adoption.

- Identification of optimal technology solutions
- Gaps analysis and feasibility assessments
- Carbon sequestration potential analysis

Green Technology Financing

Scaling green technologies requires robust financing mechanisms and bankable business models. NIGT collaborates with World Bank teams to develop practical financing approaches that can attract private investment and reduce perceived risks. By fostering innovation in financial structuring and supporting early-stage commercialization, these efforts accelerate the uptake of clean technologies in developing countries.

- Business model development for green technologies
- Facilitating investment in green technology

3. HOW NIGT AND KGGTF COLLABORATE

Knowledge Sharing and Partnership Development

NIGT is an active knowledge partner within the Korea Green Growth Trust Fund (KGGTF) platform, contributing to regional dialogues, technical workshops, and global forums. Through KGGTF, NIGT shares lessons learned from Korea's green R&D ecosystem and facilitates partnerships with public and private research institutions. These engagements create opportunities for co-innovation and strengthen country capacities to absorb and adapt green solutions.

- Sharing Korea's green technology R&D best practices in KGGTF knowledge events
- Facilitating matchmaking between World Bank staff and client countries with green technology experts and research institutions

Policy Research and Technology Transfer

One of the most valuable aspects of the NIGT–KGGTF collaboration is the ability to translate Korea's research and innovation into practical tools and strategies for **emerging economies**. This includes building digital platforms for climate resilience, conducting feasibility studies, and analyzing institutional readiness. The partnership also enables targeted technology transfers and policy dialogues, helping client countries localize solutions that have proven effective in Korea.

- Real-time data platform and AI technology advancement to increase climate resilience
- Review of existing policies and technologies for green technology deployment
- Feasibility studies and potential analysis for clean technologies
- Assessment of institutional capacity to enable a green transition

4. SPOTLIGHT: COLLABORATION EXAMPLES

Mongolia: Battery Energy Storage System (BESS) Potential Assessment

Funding: KGGTF $200,000

Partners: Ministry of Energy, National Dispatching Center of Mongolia, NIGT, One Energy Island

As Mongolia strives to diversify its energy mix and reduce its heavy reliance on coal-fired power generation, energy storage technologies are emerging as a vital enabler of a more resilient and sustainable power sector. In response to this need, the World Bank launched a targeted technical assistance initiative in 2024, supported by a $200,000 KGGTF grant, to evaluate the feasibility and strategic potential of Battery Energy Storage Systems (BESS) in Mongolia. The project is implemented in collaboration with the Ministry of Energy, the National Dispatching Center of Mongolia, and Korea's National Institute of Green Technology (NIGT).

The initiative aims to provide Mongolia with the necessary insights and planning tools to accelerate the transition to a clean energy future. Given the country's vast renewable energy resources—especially solar and wind—the integration of BESS is seen as a key step toward enabling grid stability, peak demand management, and the large-scale deployment of variable renewable energy. However, the transition requires a clear understanding of the technical, financial, and institutional dimensions of energy storage deployment.

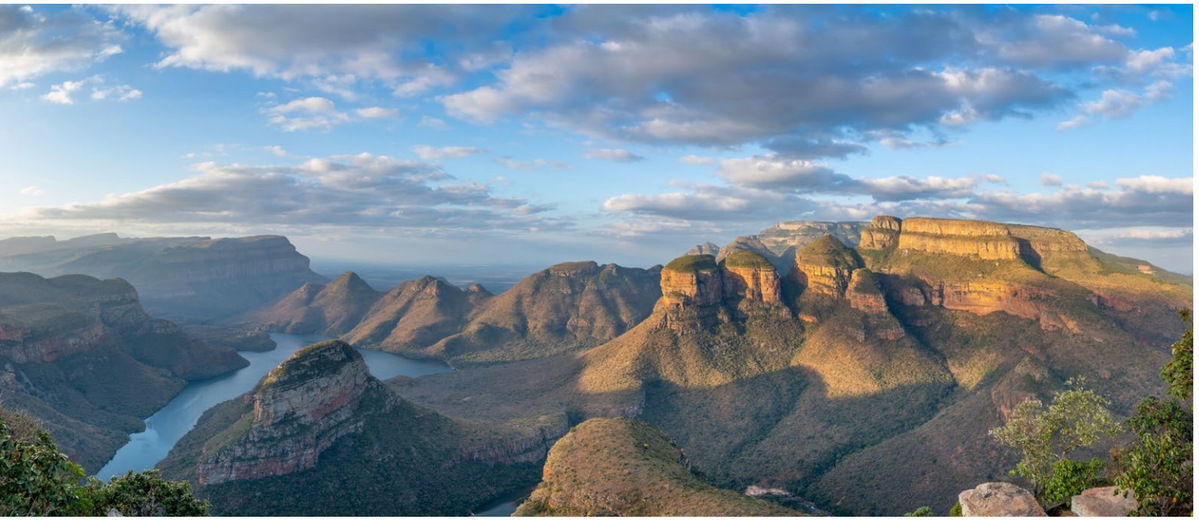
Through this collaboration, the project delivered:

- **A comprehensive techno-economic assessment**, examining the current policy environment, market readiness, technology landscape, and global trends relevant to BESS deployment. This included cost projections, regulatory gaps, and investment benchmarks.
- **An institutional capacity review**, identifying existing strengths and critical gaps within the Ministry of Energy, grid operators, and regulatory bodies. This component supported recommendations for institutional strengthening and capacity-building pathways to support BESS planning, operations, and governance.
- **A high-level investment feasibility analysis**, outlining the financial and operational viability of a potential BESS pilot or scaled project in Mongolia. This included modeling of use cases (e.g., frequency regulation, energy arbitrage, grid backup), cost-benefit considerations, and risk factors to inform future investment decisions.
- **Design of business model for scaled BESS projects,** presenting a case of private BESS services in public power markets, including Republic of Korea, recommending a proper compensation scheme to incentivize scaled BESS investment from private developers in Mongolia, and evaluation of monetary benefits of private BESS services to the Mongolian power grid.

"The KGGTF supported developing tariff structures for BESS dispatch. Properly designed tariffs can incentivize the adoption of BESS by making it economically viable for both utilities and consumers."

— Mr Gansukh Myagmar, Sr. Expert, Energy Policy Implementation and Coordination Department, Ministry of Energy of Mongolia

Together, these findings provide a foundation for the Government of Mongolia to design effective energy storage policies, attract investment, and prepare for future World Bank or private-sector–led financing. Moreover, this collaboration serves as a model for knowledge transfer between Korean innovation institutions and developing country partners through the support of global platforms like KGGTF.



Land Restoration in Retired Mining Sites – South Africa

ENVIRONMENT
Funding: KGGTF $600,000

Partners: Environment and development departments in provincial government of South Africa, NIGT, Korea Mine Rehabilitation and Mineral Resources Corporation (KOMIR)

In Mpumalanga Province, South Africa, where decades of coal mining have caused widespread environmental damage, a new vision is taking shape. Supported by $600,000 from the Korea Green Growth Trust Fund (KGGTF), a pioneering initiative is exploring effective approaches for restoring retired mining lands and transforming them for sustainable new uses.

The project, approved by KGGTF in 2023, brings together South Africa's provincial departments of environment and development, the Korea Mine Rehabilitation and Mineral Resources Corporation (KOMIR), and the National Institute of Green Technology (NIGT). The goal is to convert these lands into biodiverse spaces that provide lasting environmental, social, and economic benefits for local communities.

NIGT plays a central technical role by assessing the carbon sequestration potential of the sites, using approaches such as enhancing forest management, improving soil carbon storage, and promoting biodiversity. These assessments will help quantify climate benefits and support the creation of carbon finance mechanisms to attract future investment.

At the same time, the project is exploring new land-use possibilities such as nature reserves, eco-tourism destinations, and cultural centers that reconnect people with the land. KOMIR contributes Korea's experience in transforming former mine sites into popular attractions, including art museums and heritage parks that drive tourism and community development.

By combining Korean expertise with South African priorities, the partnership is building a forward-looking model for mine rehabilitation—one that restores ecosystems, revitalizes communities, and opens new pathways for inclusive, sustainable growth.

Green Transport Initiative – Bhutan

TRANSPORTATION
Funding: KGGTF $300,000

Partners: Bhutan Ministry of Infrastructure and Transport (MoIT), ADB, UNDP, NIGT, Korea Transport Institute (KOTI)

Launched in 2014, this two-year project provides comprehensive policy recommendations for electric vehicle deployment and public transportation improvement in Thimphu, the capital city of Bhutan, to achieve sustainable, low-carbon system in Bhutan. The project led to Bhutan Green Transport Program in 2019, where GCF and WB funds $29.6 million for modernizing urban transport to reduce GHG emissions and improve public transport efficiencies.

Climate Data Sharing Platform and AI-based Early Warning System – Samoa

DIGITAL
Funding: KGGTF $600,000

Partners: NIGT, National Information Society Agency (NIA), Global Knowledge Exchange & Development Center (GKEDC)

The KGGTF grant "Digitally Connected and Resilient Samoa Project," is supporting Samoa strengthen their climate resilience by developing and deploying practical, community-focused early warning systems and building the institutional and technical capacities needed to sustain them.

The program will pilot and validate new early warning technologies with government specialists, introduce operational systems in at least three *Fono Faavae* communities, and produce tailored technical guidelines, training materials, and readiness checklists for both national agencies and local implementers.

NIGT is expected to contribute by providing targeted activities to enhance government capacity and establish robust early warning systems. These efforts will directly support the World Bank's Digital Samoa Project by improving data-driven decision-making and equipping the government with advanced systems to respond more effectively to climate-related risks.

International Collaboration Spotlight

TRANSPORT

Roadmap for E-mobility Ecosystem – Cambodia

Funding: Green Climate Fund $224,500

Partners: Ministry of Environment of Cambodia, NIGT

As Cambodia advances its climate commitments under the Paris Agreement, the transport sector presents both a major challenge and a key opportunity. To support a shift toward cleaner, more sustainable mobility, the Green Climate Fund (GCF) has provided $224,500 to develop Cambodia's first comprehensive e-mobility roadmap. This strategic effort, led by the Ministry of Environment in partnership with Korea's National Institute of Green Technology (NIGT), lays the foundation for a national electric mobility ecosystem.

Transportation is a growing source of greenhouse gas emissions in Cambodia, particularly in urban centers like Phnom Penh, where traffic congestion, air pollution, and fossil fuel reliance are pressing issues. Yet with a relatively young vehicle fleet and strong political momentum, Cambodia is well-positioned to leapfrog to electric transport solutions. This roadmap aligns with the country's Nationally Determined Contribution (NDC) targets and provides a coordinated national vision for e-mobility.

Developed by NIGT, the roadmap presents a holistic framework built around four key pillars:

Policy and Regulatory Readiness: Recommends legal and institutional reforms, including EV and charging standards, import regulations, and incentives to accelerate adoption.

Technology and Infrastructure Planning: Offers tailored guidance on electric vehicle types (e.g., motorcycles, buses), charging solutions, and infrastructure rollout strategies.

Institutional and Financial Capacity: Analyzes coordination needs and proposes mechanisms for capacity-building and green finance mobilization across sectors.

Scenario Modeling and Target Setting: Presents multiple deployment scenarios with emissions reduction projections, cost estimates, and implementation timelines to inform investment decisions.

This evidence-based roadmap enables Cambodia to coordinate across ministries, engage stakeholders, and attract climate finance with a clear, actionable plan. The policy actions outlined in the roadmap have informed the formulation of Cambodia's National Policy on the Development of Electric Vehicles 2024–2030. The collaboration also highlights the value of global knowledge exchange, drawing on Korea's experience to inform Cambodia's transport transition. With this roadmap, Cambodia is taking a decisive step toward a greener, low-carbon future in mobility—advancing both national development and global climate goals.

ADDITIONAL RESOURCES

The collaboration between NIGT, KGGTF, and World Bank teams showcases the power of knowledge exchange to tackle pressing global challenges. By bridging Korean innovation with local development priorities, these partnerships help countries to unleash climate resilient, sustainable development.

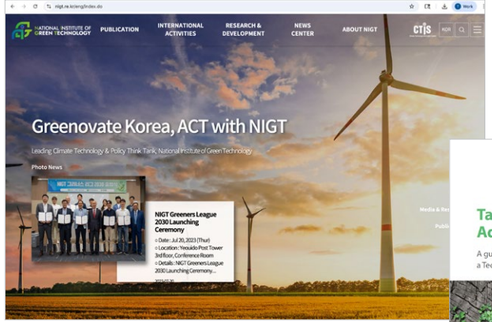
NIGT Website
https://nigt.re.kr/eng/gtcvod.do

Climate Technology Information Systems
https://ctis.re.kr/en/index.do

Taxonomy of Climate Change Adaptation Technology (2021)
https://nigt.re.kr/eng/others.do?mode=view&articleNo=2494&title=Taxonomy+of+Climate+Change+Adaptation+Technology

NIGT Policy & Cooperation Insights
https://nigt.re.kr/eng/others.do

Global R&D Strategy Map for Carbon Neutrality
https://nigt.re.kr/gtck/resultImg.do?mode=view&articleNo=3779&article.offset=0&articleLimit=10



NIGT Website

Taxonomy of Climate Change Adaptation Technology (2021)

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