



Republic of Korea

Web-based GHG Management System of the Republic of Korea

Activity	The innovative web-based National Greenhouse Gas (GHG) Management System (NGMS) establishes an annual work cycle beginning with the designation of the emitting industrial installations or controlled entities (CEs), target setting, submission and verification of implementation plans and implementation reports.
Country	Republic of Korea
Sector(s) involved	Industry, Power generation, Buildings, Transport, Waste, and Agriculture
Time frame	2013 onwards
Case summary	<p>The step-wise evolution of the GHG and Energy Target Management System (TMS) of the Republic of Korea, launched in 2010, has grown to cover 840 industrial installations, otherwise known as controlled entities (CEs). In 2013, the TMS instituted a web-based GHG Management System (NGMS) based on a common reporting framework that includes provisions for built-in verification, independent third party verification, public disclosure of data submitted by CEs and generation of time series analysis and reports.</p> <p>The reporting system follows a robust annual work cycle beginning with the designation of the CEs, target setting, submission of implementation plans, verification of implementation plans and implementation reporting. The annual cycle not only facilitates monitoring, reporting and verification (MRV) and continuous expansion of coverage, but also supports the preparations of national communications and biennial update reports (BURs). The National GHG Management System is considered a good practice since it has established a system for regular tracking of GHG emissions from an increasing number of emission points with a quality assurance process through independent expert verification, which enhances and harmonises the updating of GHG inventories and timely reporting to the UNFCCC.</p>



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Background

The Republic of Korea is one of the first developing countries to establish a dynamic MRV system to track annual energy consumption and GHG emissions by individual installations. The first step in developing the system was in 2009 with the assignment of energy consumption reduction targets, after an earlier unsuccessful attempt to introduce a national emissions trading scheme due to a lack of political acceptance. Between 2010 and 2012, under the leadership of President Lee Myung-bak, Korea established GHG emission reduction targets and created the Energy and GHG Target Management System (TMS). The TMS is part of the Korean National Green Growth Strategy, which is embedded in the Framework Act on Low Carbon and Green Growth of 2010.

The TMS is based on direct negotiations between the government and business operators to decide: (1) specific reduction targets for energy consumption and GHG emissions and (2) common MRV procedures to evaluate emissions reduction compliance. During negotiations over the MRV system, aspects such as the current level of technology and potential implications for trade were considered, providing a foundation for strong trust and cooperation between the government and business actors and ensuring ownership of the scheme by individual CEs.

The TMS is evolving in a phased manner by regularly revising the criteria for the selection of CEs, i.e. using benchmarks for energy consumption and GHG emissions. In the first phase, the Ministry of Knowledge Economy (MKE) negotiated with 38 CEOs associated with 47 installations, and this number has grown to 840 CEOs today, of which 525 participate in the national emissions trading scheme launched in 2015. As of 2014, Korea selected as CEs those business entities that generate GHG emissions in the range of more than 50,000 tonnes CO₂eq and consume over 200 TJ of energy annually, or that generate more than 15,000 tonnes CO₂eq and consume over 80 TJ of energy annually. In 2013, the TMS developed a web-based National GHG Management System known as NGMS.

Monitoring and reporting of utility-level GHG emissions form the basis of the TMS regulation's implementation. Guidelines for the operation of the TMS are established, and continuously revised, by the Ministry of Environment. The Ministry uses the best available and adequate estimation methodologies, as well as international standards for management of emission factors and activity data in order to establish a world-class GHG MRV system. The Ministry has appointed 24 expert agencies with qualified verifiers that have passed strict certificate examinations as verification agencies for the third party verification of GHG emissions and energy consumption.

Activities

The activities constituting the annual cycle under the NGMS are the following:

- » **Setting guidelines:** The Ministry of Environment annually sets and revises sectoral guidelines for selection of CEs on the basis of their energy consumption and GHG emissions. In addition and according to the latest estimation methodologies, the Ministry also revises the guidelines under the **common reporting framework** on the basis of which CEs are required to submit their progress reports.
- » **Designating CEs and setting negotiated targets:** Following the revised guidelines, the controlling departments or relevant ministries enter into dialogue with identified CEs to discuss their specific energy consumption and GHG emission reduction targets.
- » **Implementation plans by CEs:** The CEs submit yearly and five-yearly implementation plans including information on GHG emissions estimates, mitigation plans, energy consumption estimates and energy conservation plans with details on methodologies used for GHG emissions and energy consumption estimation (including calculation and measurement methods).
- » **Implementation reports by CEs:** The CEs submit their reports on implementation and the respective mitigation impact through the web-based platform.

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- » **Third party verification:** Upon submission through the web-based platform, certified third party verifiers that are contracted by the CEs conduct field visits to verify the reports. This is further crosschecked by built-in verification through time-series data generation in the web-based system.
- » **Review and recommendations to CEs:** Controlling departments review the implementation report and issue certificates. In case of non-compliance, recommendations for further improvement are made.
- » **Penalties and support:** There are no penalties for not meeting the targets but there are significant penalties if CEs fail to report. CEs are encouraged to meet their targets as soon as possible. The government provides technical support, as needed, to achieve improvement.
- » **Public disclosure decision:** The information provided by the CEs is generally made public, unless the CE requests it not to be.

Institutions involved

- » Ministry of Environment: overall oversight, sets standards and guidelines, certification of verifiers, controlling department for the waste sector
- » Ministry of Agriculture, Forestry and Rural Affairs: controlling department for the food sector
- » Ministry of Trade, Industry and Energy: controlling department for the industry sector
- » Ministry of Land, Infrastructure and Transport: controlling department for the transport sector
- » Greenhouse Gas Inventory and Research Centre of Korea (GIR): publishes guidelines for MRV, manages data and registry, research and analysis to implement the process through the annual cycle
- » National Institute of Environmental Research: research, analysis and training

Cooperation with

No direct cooperation with any international agency was needed to develop the web-based MRV system.

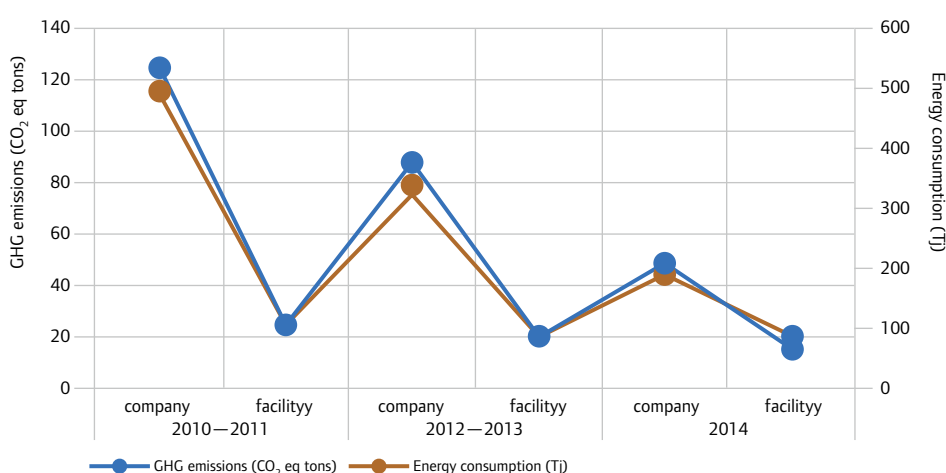
Finance

The Ministry for the Environment's annual budget provides financial resources to develop and implement the web-based reporting system.

People

- » Focal points with the four primary ministries involved that control the CEs
- » Managers at the NGMS and NIRS (National Inventory Reporting System)
- » CEOs of CEs
- » Certified independent verifying bodies

Evolution of Criteria for Selecting Controlled Entities (CEs)



Source: www.gir.go.kr/eng/index.do?menuId=10

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Impact of activities

- » **Latest data on GHG and energy consumption:** Korea has set-up a strong platform to collect up-to-date and verified data for GHG emissions and energy consumption of selected industry installations on an annual basis. Since the coverage of TMS is gradually increasing, over time the country will be able to generate country level data with increasing accuracy.
- » **National capacities:** The process of establishing and implementing a web-based MRV system has enabled Korea to keep track not only of GHG emissions but also of options available for mitigation and of changing barriers faced by industry. It has also strengthened capacities of the companies to identify and implement options for GHG mitigation and energy saving through monitoring implementation and their impacts.
- » **Emission Trading System (ETS) is made possible:** The TMS regulation led to total emission reductions of 21.3 million tonnes of CO₂eq in 2012, equalling 3.78% of the total emission projections. This reduction was 2.7 times the 2012 national reduction target of 7.95 million tonnes of CO₂eq. A total of 372 CEs surpassed their reduction targets, amounting to 30.05 million tonnes of CO₂eq. This excess of the reduction target can be used as reduction credits under the South Korean ETS that starts in 2015. The credits produced through the excess reductions correspond to less than 3% of total allocated allowances. South Korea had already attempted to establish an ETS in 2009, but faced resistance from the industry. The TMS has made the ETS possible and acceptable.
- » **Informed dialogue between government and private sector:** The annual cycle of MRV, along with verified implementation reports, facilitate negotiations between controlling ministries and the CEOs of CEs. This has built the basis for more cooperation and trust among the key actors for GHG reduction and energy conservation.
- » **Improved coordination among various government departments:** The implementation of the annual MRV system involves regular meetings between the Ministry of Environment, Greenhouse Gas Inventory and Research Centre of Korea (GIR) and relevant government departments.

Why is it good practice

- » **Regular tracking:** The annual cycle of target setting, reporting and review enables the government and companies to **keep regular and substantive track of progress**. Penalisation for not reporting ensures that all CEs submit their reports on time, ensuring the **most recent data** on emissions.
- » **In line with Biennial Reports and Biennial Update Reports (BR and BUR) requirements:** Comprehensive guidance for MRV, published by the GIR, includes **IPCC guidelines for national inventory measurement and reporting** and is defined in the context of National Inventory Measurement Principles. The guidelines address organisational boundaries, estimation methodologies (equations), emissions factors (parameters needed for estimation) and activity data to measure emission sources and sinks in the country. Utility-level inventory reporting guidelines include estimation methods (calculation methods using Tier 1, 2 and 3 and measurement method using Tier 4 Continuous Emissions Monitoring).
- » **Quality assurance:** The web-based reporting enables the government to check for consistency in reporting through the application of time-series analysis. In addition, verification by **certified independent verifiers** through field visits ensures quality and accuracy of the information provided. Guidance on verification also includes checklists for verifying whether a national inventory is complying with a common reporting framework addressing transparency, accuracy, consistency, comparability, and completeness of reports.
- » **Adequate resources:** The NGMS is funded through an annual budget with full-time staff. In addition, the government has trained and certified independent verifiers in 24 organisations to ensure adequate capacity is available.

Success factors

- » **Political leadership:** The MRV system is backed by strong personal interest of the President and grounded in the Framework Act on Low Carbon and Green Growth of 2010.

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- » **Ownership by private sector through dialogue:** The NGMS is not a typical command and control system. It is based on repeated dialogue and the establishment of networks to encourage the government and private sector to work together. Target-setting is based on dialogues with the CEOs of CEs, and non-compliance with the targets is met by recommendations and assistance by the government instead of penalties. This provides strong incentives, trust and ownership for the private sector to actively participate and report.
- » **Gradual process:** The annual work cycle of the NGMS, including a gradual expansion of coverage, has helped to build evidence, confidence and the necessary capacities contributing to the success of the MRV system.
- » **Adequate financial and human resources:** The MRV system is fully integrated into the governance structure and managed through annual departmental budgets and full-time employees, which ensures a smooth operation of the system.

Overcoming barriers/ challenges

Political/Policy

What were the main barriers/challenges to delivery?
How were these barriers/challenges overcome?

Getting the private sector on board was difficult in earlier attempts to set up an MRV system for ETS.

An approach based on frequent dialogue for target setting, the absence of penalisation for non-compliance and a cooperative approach between the government and private sector has resolved the earlier deadlock.

Technical Capacity

Availability of capable verifiers and systems of measuring and reporting at the utility level was an issue during the early phase of design.

The government trained the verifiers and certified them. In addition, the provision of a common reporting framework and templates along with assistance in identifying and implementing GHG emission reduction measures has built capacities at the government and utility levels.

Institutional

There was general apprehension about the public disclosure of information provided by the CEs, which could conflict with their business interests.

In principle, Emissions Reports are open to the public, but if a utility applies for confidentiality for the reasons of business secret or others and the Evaluation Committee approves the application, the utility's report may be closed to the public.

Information

A challenge lies in defining a baseline for energy consumption and GHG emissions for the CEs under the scheme.

The government uses existing data from relevant line ministries and the department of statistics. Accordingly, and in consultation with the private sector on information regarding the technical and commercial challenges, the government decides on the benchmark.

Lessons learned

The most significant outcome of the NGMS has been a change in the attitude of the private sector. The government, building on strong political leadership from the top (the President), was already interested in setting targets but, at the beginning, even the flexibility of the ETS did not convince the private sector to participate. Critical choices made by the government that facilitated the change in the attitude of private sector included the following:

- » The most significant outcome of the NGMS has been a change in the attitude of the private sector. The government, building on strong political leadership from the top (the President), was already interested in setting targets but, at the beginning, even the flexibility of the ETS did not convince the private sector to participate. Critical choices made by the government that facilitated the change in the attitude of private sector included the following:

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- » Prior consultation with all stakeholders, particularly those who are essential for implementation is critical.
- » Demonstration at smaller scale of implementation followed by repeated dialogue with existing and new participants helps in successful up-scaling
- » Integration of the new processes into the annual work cycle of relevant government department not only makes the implementation smooth but can also reduce the burden of cost.
- » Each participant may have different challenges in meeting the requirements of new MRV system. Addressing these challenges on a case-by-case basis to the extent possible is critical for building trust and acceptability among stakeholders.

How to replicate this practice

Replication of the South Korean experience with GHG management could be built along the following considerations:

- » Begin with consultation and confidence building while being sensitive to commercial concerns of the private sector
- » Demonstrate at a smaller scale of implementation and scale up gradually through repeated dialogue. While scaling up, challenges of transaction cost of dialogue must be considered carefully. Currently in South Korea, there are only four controlling departments/ministries negotiating with companies. The Ministry of the Environment coordinates these discussions through multiple meetings. As the number of companies increases, and more line ministries begin to participate as controlling departments, managing dialogues for annual cycles may become very challenging and expensive. In such a situation, one option is to shift to a longer three- or five-year cycle. The system already requires five-year planning by CEs, therefore shifting to a longer cycle should not be difficult. Hence, adequate consideration should be given to the preparation regarding the management of transaction costs and dialogue in the process of scaling up
- » Assist the private sector in addressing specific challenges on a case-by-case basis
- » Integrate the process into the annual work routine of the government

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Further key resources

- » Yéwon KIM, 2014, Sharing Asian Experiences: Korea (Challenges and strengths in national institutional systems for responding to the reporting requirements of the UNFCCC). Available at mitigationpartnership.net/sites/default/files/u1585/day_1-3.ipm8juillet2014.pdf

Website(s)

- » www.gir.go.kr/eng/index.do?menuId=10

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