

MRV-Based Policy Framework for Reducing Methane Emissions in Korea's Energy Sector

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Climate
Change
Foundation



Introduction

1. Korea's Key

Methane Challenge Lies in Imported Energy Supply Chains.

- Methane policy should begin with establishing a robust measurement, reporting and verification (MRV) system capable of identifying and quantifying actual emissions and their sources before determining what should be regulated.
- As a major energy-importing country with virtually no domestic oil and gas production, Korea faces a different methane policy challenge from producer countries such as the United States and Canada. Methane emissions associated with Korea's imported oil and gas supply chains are estimated to substantially exceed those from domestic oil and gas operations.
- Korea therefore needs a policy approach tailored to its position as an energy importer, combining buyer leverage across overseas supply chains, existing safety and management systems for domestic downstream infrastructure, and alignment with international MRV frameworks.

Key Messages

2-1. MRV as the Foundation for Leveraging Buyer Influence

- Methane emissions can be dominated by a small number of super-emitting and intermittent sources, making conventional emission-factor approaches insufficient to capture actual emissions. Korea should therefore establish a layered MRV system combining satellite, aerial/drone, OGI, sensors, and ground-based monitoring, aligned with OGMP 2.0 Levels 4–5 and EU methodologies. Given the high coverage of Korean LNG supplies under OGMP 2.0, Korea's priority should be to leverage existing international methane data through procurement contracts and buyer requirements, including OGMP participation, methane intensity, LDAR, venting/flaring management, and independent verification. Joint action with Japan could further strengthen buyer leverage across Northeast Asia.

2-2. Korea-Specific Methane MRV Framework

- **The framework should be built around six priorities:**
 - ① Improve the national inventory by disaggregating fugitive emission sources and incorporating satellite, aerial and ground-based observations.
 - ② Strengthen facility-level reporting by introducing methane-specific reporting items and requiring asset- and site-level activity data and LDAR records.
 - ③ Develop beyond Tier 2 emission factors based on actual measurements reflecting Korea's domestic gas pipelines and LNG infrastructure.
 - ④ Establish a layered MRV system combining satellite, aerial/drone, OGI, fixed sensors and mobile ground-based measurements.
 - ⑤ Institutionalize a measurement-to-inventory feedback loop linking measurements, emission-factor development, inventory updates and subsequent remeasurement.
 - ⑥ Align with international standards, particularly OGMP 2.0 and EU methodologies, to ensure interoperability and minimize duplicate reporting.

2-3. Using Contracts and Procurement to Address Upstream Methane Emissions

- Rather than directly regulating overseas producers, Korea can leverage its position as a major energy buyer through contractual and procurement mechanisms:
 - Incorporate methane data disclosure, reporting and verification requirements into long-term LNG and crude oil contracts.
 - Assess suppliers' OGMP 2.0 participation and reporting levels.
 - Require project-level information on methane intensity and LDAR practices.
 - Consider venting and flaring management and independent verification as procurement criteria.
 - Establish a methane profile database covering supplying countries and projects.
 - Establish a supply-chain methane coordination mechanism involving KOGAS, KNOC and private LNG importers.
 - Coordinate with Japan to leverage joint buyer power and common procurement criteria.
 - Introduce supply-chain methane disclosure requirements on a phased basis.
 - Expand the CLEAN Initiative to strengthen data collection, transparency and buyer coordination

2-4. Leverage Existing Safety Management Systems for Domestic Downstream Emissions

- For domestic downstream infrastructure, Korea should leverage existing safety management systems rather than create a parallel regulatory regime.

Rather than establishing an entirely new methane-specific regulatory framework, Korea could integrate quantification and reporting requirements for climate purposes into existing safety inspection systems under the City Gas Business Act and the High-Pressure Gas Safety Control Act.

Priority sources could include:

- City gas pipelines
- Pressure-regulating facilities
- LNG receiving terminals
- LNG storage and regasification facilities
- LNG power-generation facilities

This approach would help minimize regulatory duplication while strengthening methane measurement and reporting across domestic downstream infrastructure.

2-5. Design Cost Recovery and Economic Incentives Alongside Methane Abatement Obligations

- Methane is distinctive in that it is both a climate pollutant when released into the atmosphere and a usable energy resource when captured. Allowing operators to retain and monetize the value of recovered methane could therefore provide an important economic incentive and help offset a significant share of abatement costs.
 - ① **Utilizing the Fuel Value of Recovered Methane:** Recovered methane could be sold or reused, allowing part of the abatement cost to be offset through the economic value of the recovered gas.
 - ② **Incorporating Eligible Costs into the Gas Rate Base:** Appropriate MRV, LDAR and equipment-upgrade costs could be recognized as eligible costs and gradually incorporated into regulated gas tariffs.
 - ③ **Performance-Based Investment Returns:** Companies achieving verified methane reductions through investment in abatement equipment could be eligible for cost recovery and performance-based returns.
 - ④ **Exploring Linkages with the Emissions Trading System:** Verified methane reductions could potentially be converted into CO₂e and considered within the ETS framework, subject to appropriate methodologies and safeguards against double counting.
 - ⑤ **Leveraging Joint Korea-Japan Buyer Power:** Korea and Japan could jointly establish data, verification and abatement requirements for lower-methane LNG, strengthening negotiating power while reducing transaction and verification costs for individual buyers.

Conclusion

3. Build MRV First, Then Scale Up Policy Implementation

- **A Phased Roadmap: From MRV to Policy Implementation**

Rather than introducing comprehensive methane regulation immediately, Korea should adopt a phased approach:

MRV establishment → Measurement & Verification → Pilot projects → Institutionalization → Mandatory requirements

Phase	Period	Key Priorities
Phase 1: Foundation	2027 -2028	MRV framework, Tier 2 emission factors, MARS focal point, contractual requirements, LDAR pilots
Phase 2: Institutionalization	2029 -2030	Expanded measurement-based reporting, verification, disclosure, and LDAR
Phase 3: Advanced Implementation	2031 -2035	Mandatory measurement-based reporting, methane intensity in procurement criteria, mandatory LDAR, potential ETS integration