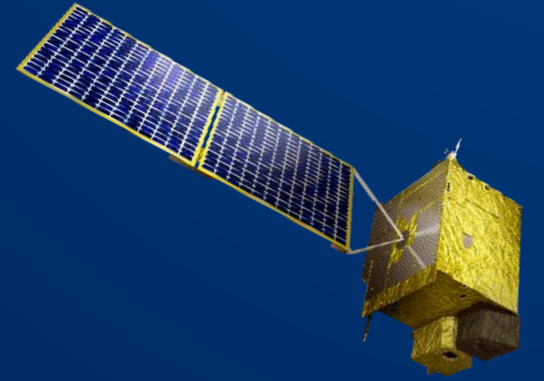


Development of micro-satellite constellation for greenhouse gas monitoring

4th June, 2026



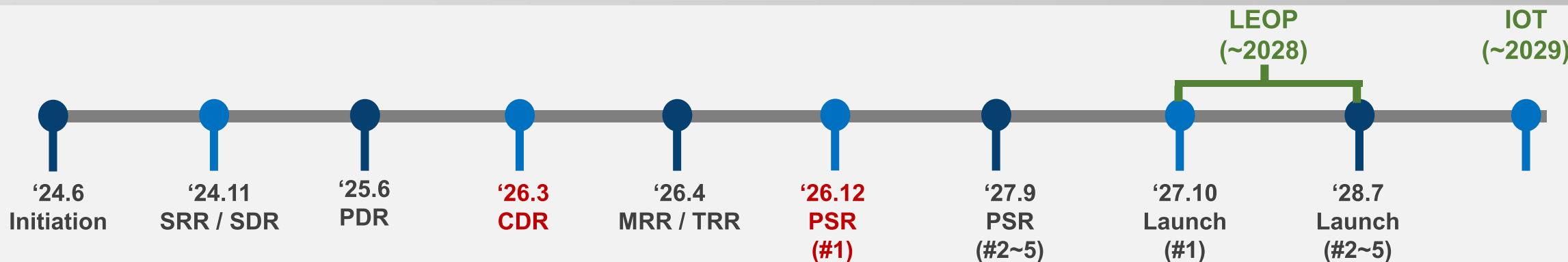
Ministry of Climate, Energy and Environment

National Institute of Environmental Research
Environmental Satellite Center

- Project

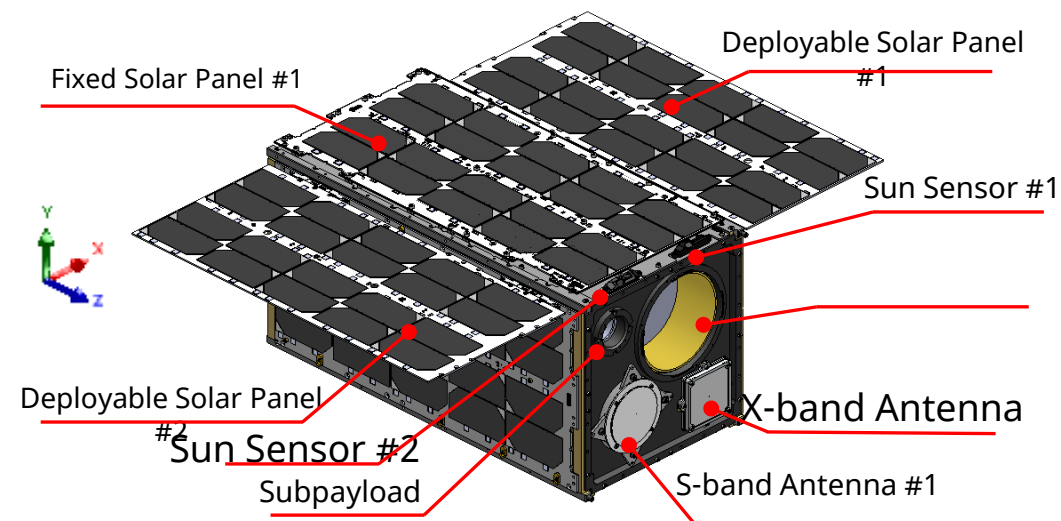
- ✓ Development of 5 micro-satellite (1 for CO₂, 4 for CH₄) for greenhouse gas monitoring and satellite-based validation of Korea's green house gas inventory
 - * The satellite's name will be decided in August through a nationwide public contest
- ✓ Led by NIER, funded by Ministry of Climate, Energy and Environment (MCEE), Korea
- ✓ Developed by Hanwha Systems, a company with experience in satellite and aerospace system development

- Project Timeline

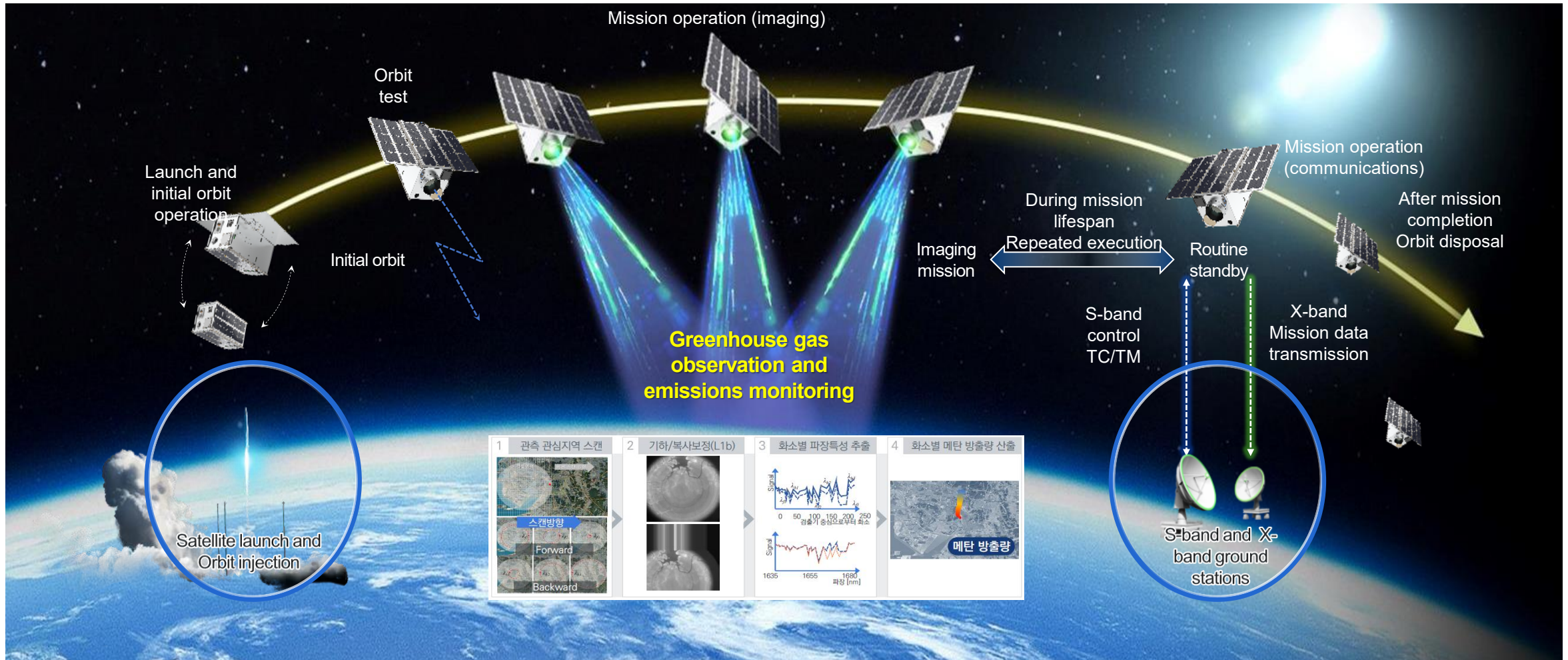


Overview of Project

Item	Main Specifications
Altitude / Orbit	Altitude 510km / Sun-synchronous Orbit
Life span	Over 3 years
Observation Area / Swath / Spatial Resolution	Global / 15 km x 20 km / within 31m
Temporal Resolution (Data Collection Cycle)	15 times/(day/sector) global observation, 1 time/(2-3 days/sector) Korean Peninsula observation
Observation Wavelength / Spectral Resolution	Methane (1,6**~1,6**nm) Carbon Dioxide (1,5**~1,6**nm) / 0.1 nm
Single Observation Time	20 seconds (0.2 seconds, 200 Frames)
Size (* 1U: 10cm) / Weight	16U standard size (25×25×46cm) / ~22 kg



Mission Concept



1	Launch and initial orbit operation
	Launch and power on
	Initial attitude/orbit acquisition

2	Orbit test
	Gyro/sensor calibration
	Acquisition of greenhouse gas images for performance validation and calibration

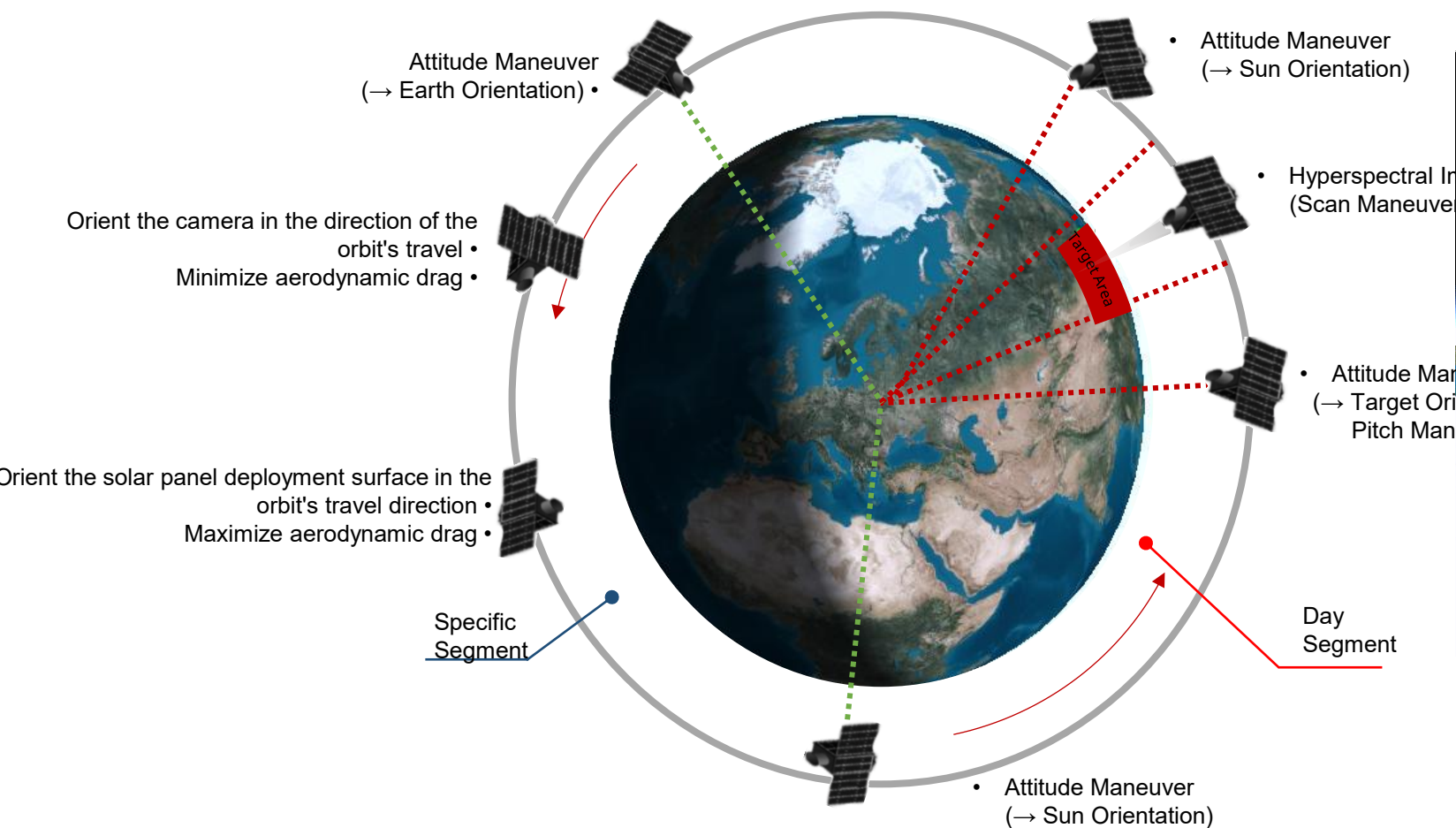
3	Mission operation (imaging)
	Attitude maneuver for targeted area imaging
	Ground/sea observation image capturing

4	Mission operation (communications)
	Ground station pointing
	Mission data transmission

✓ Mission Orbit

- **Standard Scan:** Scan a 15*20 km area over 20 seconds with 200 Frames

* **Extended Scan:** Scan a 15*42.5 km area over 50 seconds with 500 Frames



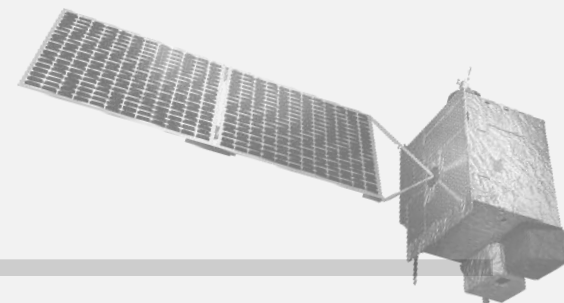
✓ Review of Scan Area

- Sub-Payload Scan Area: 35km x 50km
- Detection by Fabry-Pérot Interferometer



→ Satellite Motion Direction

- **Project is ongoing well**
- **Observation plan, eg. target area, is being discussed**
- **Coordination with other observations, eg. ground-based and aircraft, is being discussed**
 - * **Ground-based remote sensing equipment for green house gas is under development.**
- **Algorithms development has been started**
- **Collaboration with other organizations operating green house gas satellites for data mutual exchange, validation and calibration**



“ We look forward to hearing from you regarding potential cooperation. ”



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- **GEMS-2 mission is undergoing a preliminary feasibility study, with results expected in August this year.**
- **Why your support matter?**

Your organization's endorsement will

- Demonstrate international demand and user engagement**
- Strengthen the scientific and social impact of GEMS2**
- Highlight collaborative opportunities in environmental monitoring**

We will send the request by e-mail and would greatly appreciate your reply.