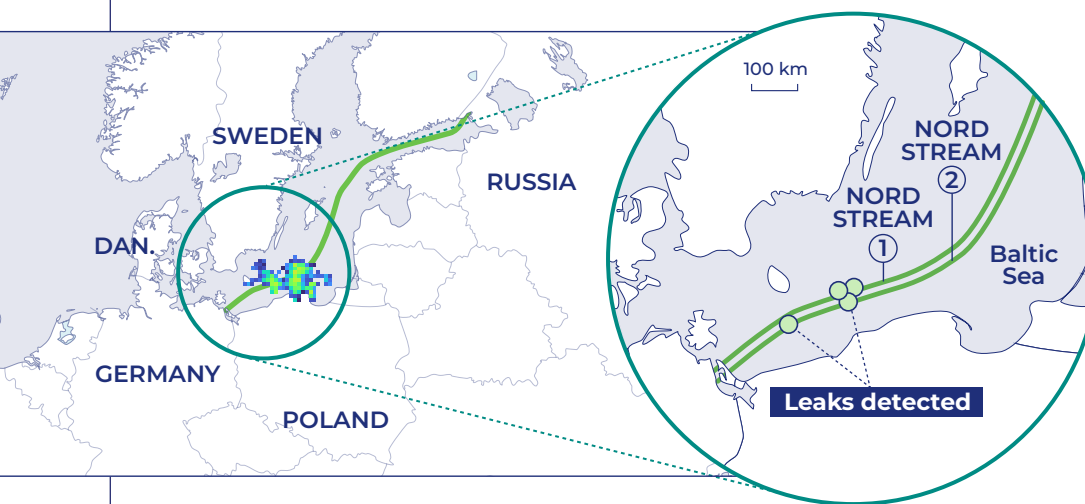


OVERVIEW

Continuous monitoring of Critical National Infrastructure (CNI) is vital for governments seeking to reduce the risks of damage, sabotage, or geopolitical disruption. The 2022 Nord Stream pipeline explosions serve as an example of how unforeseen events can disrupt a nation's economy and affect its citizens.

GHGSat provided the **first independent quantification of the methane emissions** released during the incident. This use case shows how frequent emissions monitoring can help governments detect threats earlier, assess damages faster, and build long-term strategies.

Nord Stream 2022 Incident at a Glance



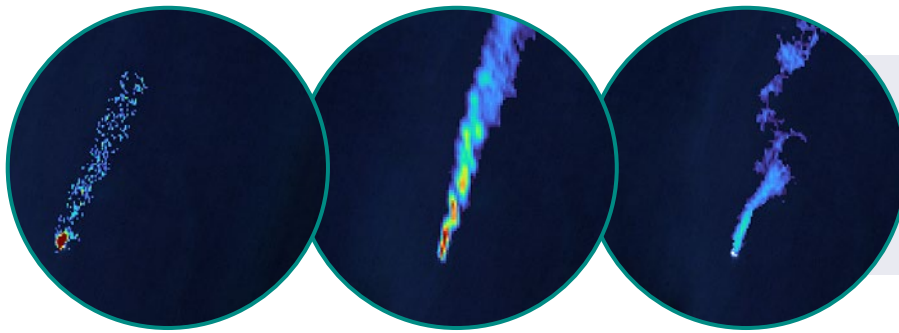
- **Sept 26, 2022:** Explosions damage Nord Stream 1 & 2 pipelines in the Baltic Sea.
- Seismic data confirms underwater blasts; gas seen bubbling to the surface.
- Attributed to sabotage; no definitive perpetrator.
- Up to **465,000 tonnes** methane released.
- **Over €11B** in infrastructure losses and emergency federal spending.

CHALLENGES

- **Limited visibility** over offshore or underwater assets.
- **Delayed or incomplete data** limiting effective response.
- **Inability to quantify** full environmental or economic fallout.
- **Rising geopolitical threats** targeting energy systems.
- **Strategic dependence** on foreign energy supplies.

GHGSAT SOLUTION

- **Accurate Emissions Quantification:** High-resolution methane data ($\leq 25\text{m}$).
- **Frequent Monitoring:** 14-satellite constellation with daily revisit times.
- **Timely Insights:** Consistent measurements for rapid response.
- **Global Coverage:** Monitors anywhere around the globe.
- **Pioneering Technology:** Detects emissions over water.
- **Secure data delivery:** Delivers data through trusted platform directly to decision-makers.



Nord Stream

Satellite CH₄ Measurements from GHGSat-C2, C1, and C4 — two hours apart.

RESULTS

- **Delivered independent emissions data within a day**, giving authorities early insight into the scale and severity of the leak.
- **Rapidly tasked multiple satellites** to observe the leak site, enabling quantification over water.
- **Confirmed leak mitigation** through follow-up satellite pass supporting mitigation efforts.
- **Provided trusted third-party validation**, supporting public communication, transparency, and coordination with international partners.
- **Demonstrated the strategic role of satellite monitoring** in emergency response and infrastructure resilience planning.

KEY TAKEAWAYS

- 1 Energy infrastructures require **continuous, independent oversight** for early detection.
- 2 GHGSat delivers **timely, high-resolution data** to support crisis response and long-term strategy.
- 3 Satellite emissions monitoring is a **critical tool** for national resilience.



Full details available in the scientific paper published by Nature.

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