



Satellite-based technology for safe transport and distribution of energy

Earth Observation Based Monitoring of Energy Corridors

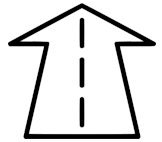


Safeguard your assets, keep an eye on the grid!

Background



Energy is transported through a complex energy grid



In the future, energy will still be transported through the (current) energy grid



Largest challenge for transport and distribution of energy: leakages²



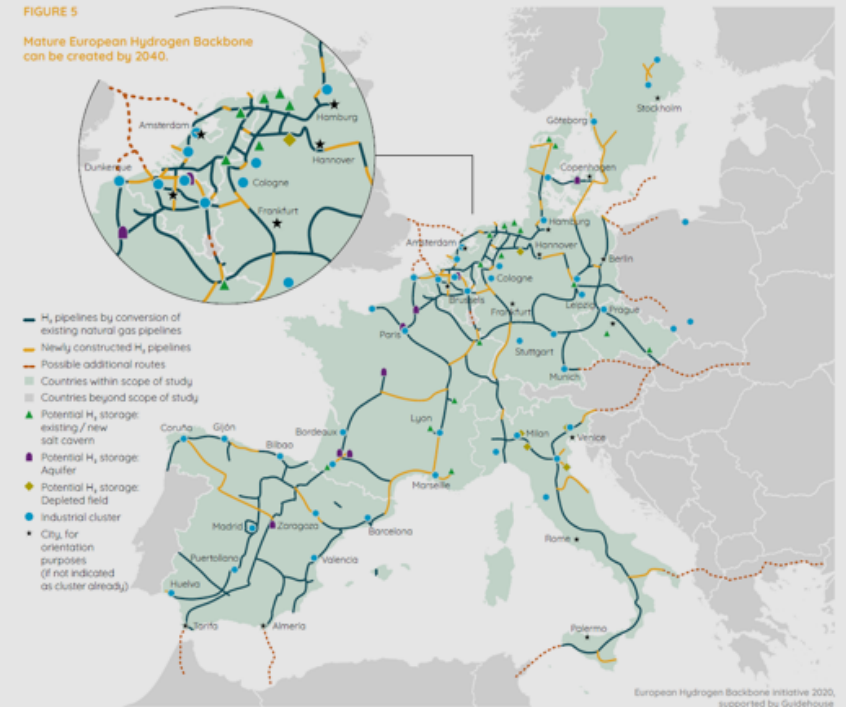
Essential to prevent leakages

European hydrogen infrastructure

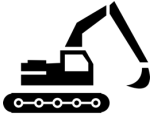
- **2030:** 6800 kilometres
- **2040:** 23000 kilometre
 - 75% of network must consist of modified gas pipelines¹

FIGURE 5

Mature European Hydrogen Backbone can be created by 2040.



Background



External interference #1 cause for leakages



Monitoring of energy grid to prevent incidents (leakages) is important

- To ensure continuous supply of energy
- To prevent accidents
- To reduce harmful emissions

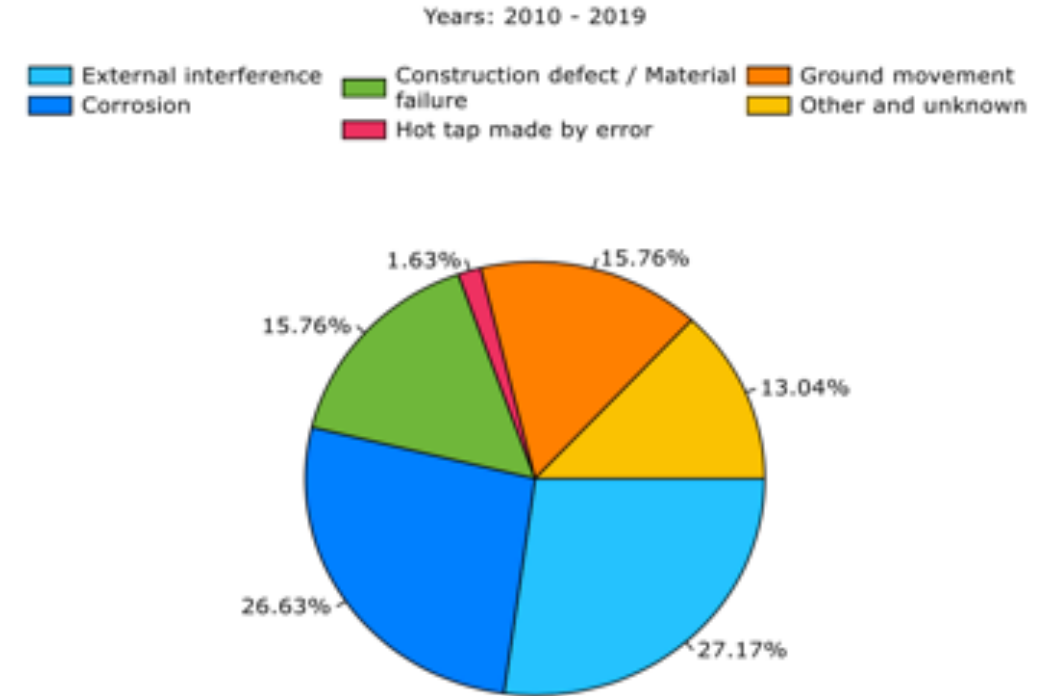


Current monitoring methods

- Helicopter
- Field inspections by car

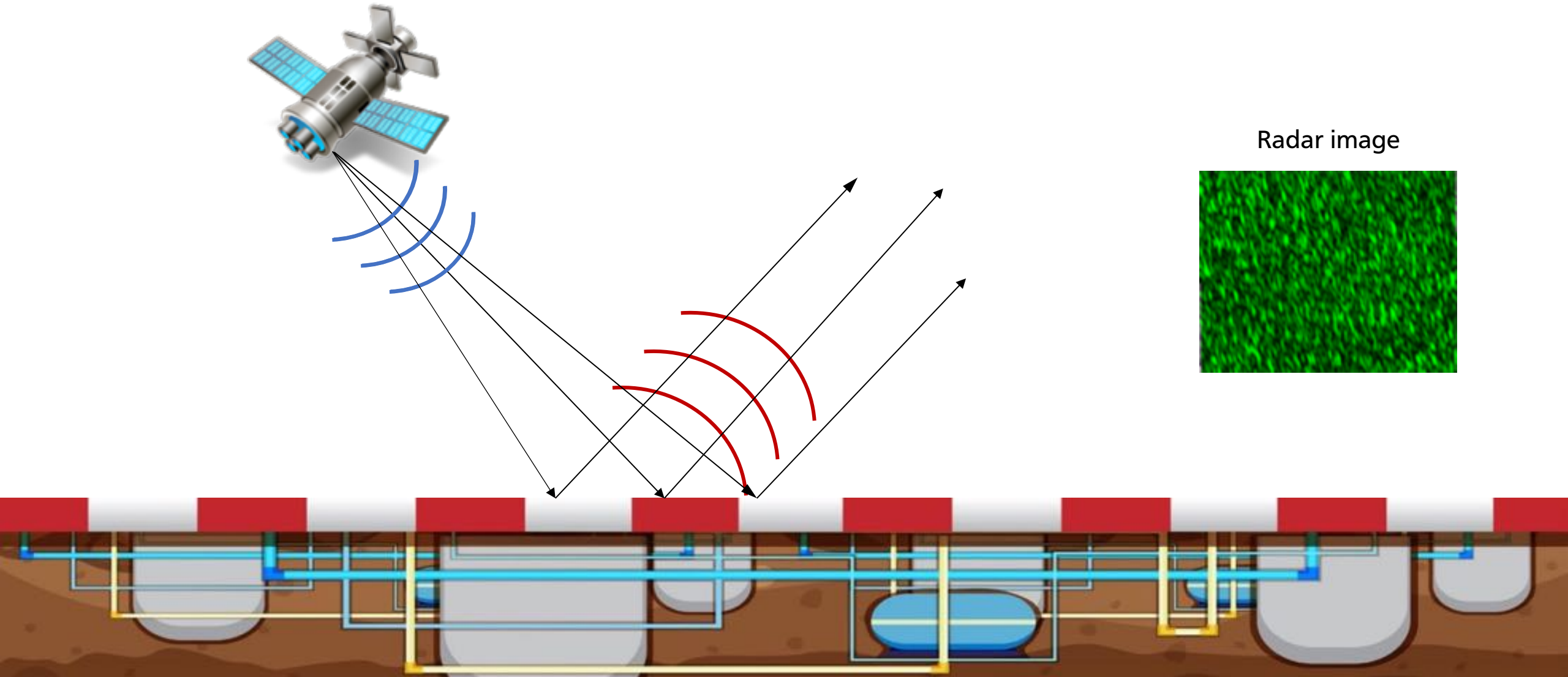


Monitoring method of the future: satellite-based monitoring

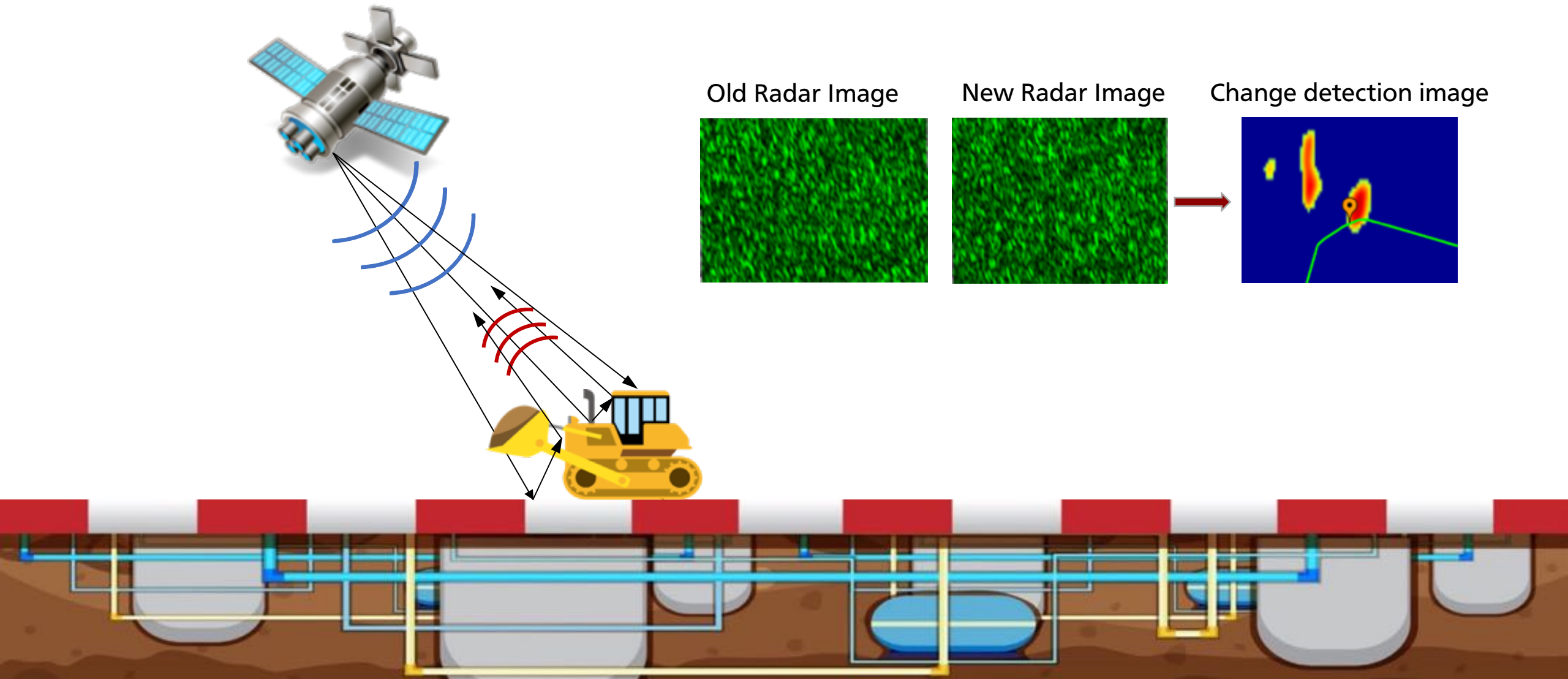


Distribution of incidents around gas pipelines (2010 – 2019)⁴

How does it work? –Process SAR imagery to detect changes

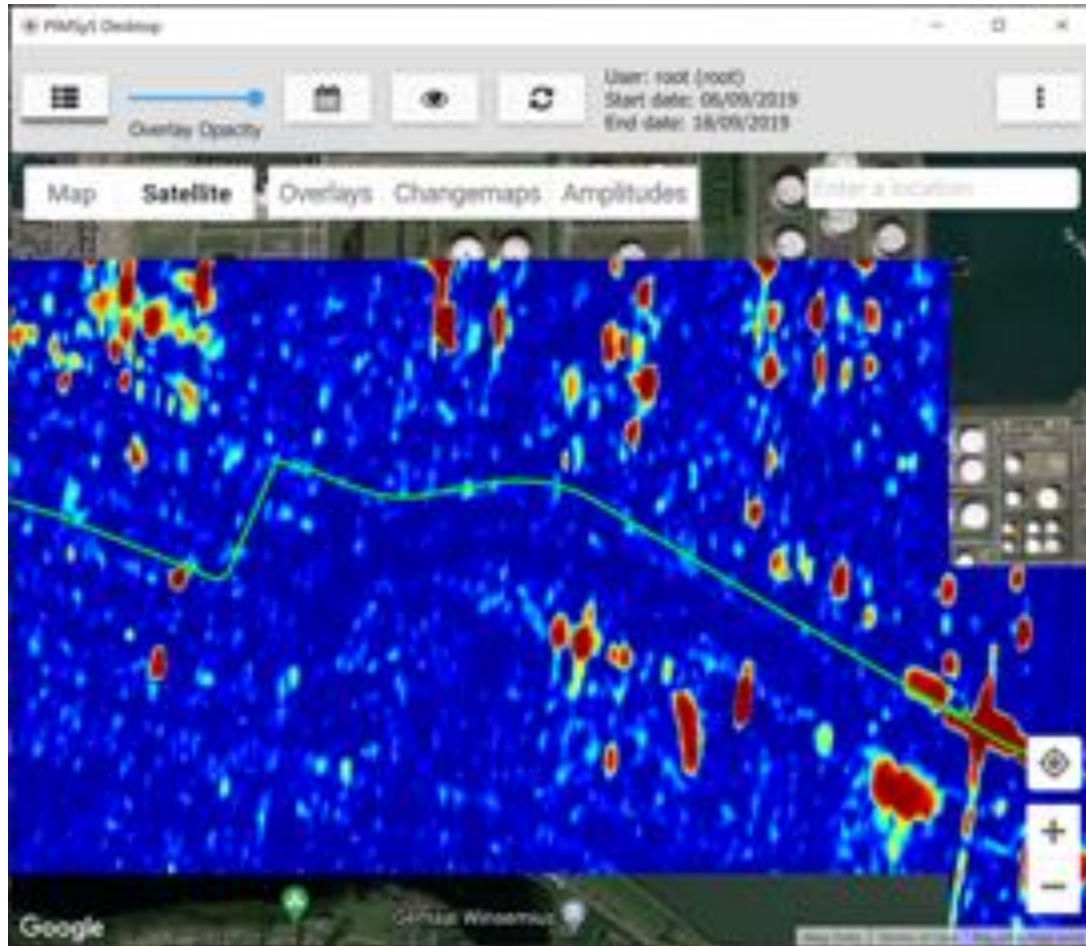


How does it work? – Process SAR imagery to detect changes

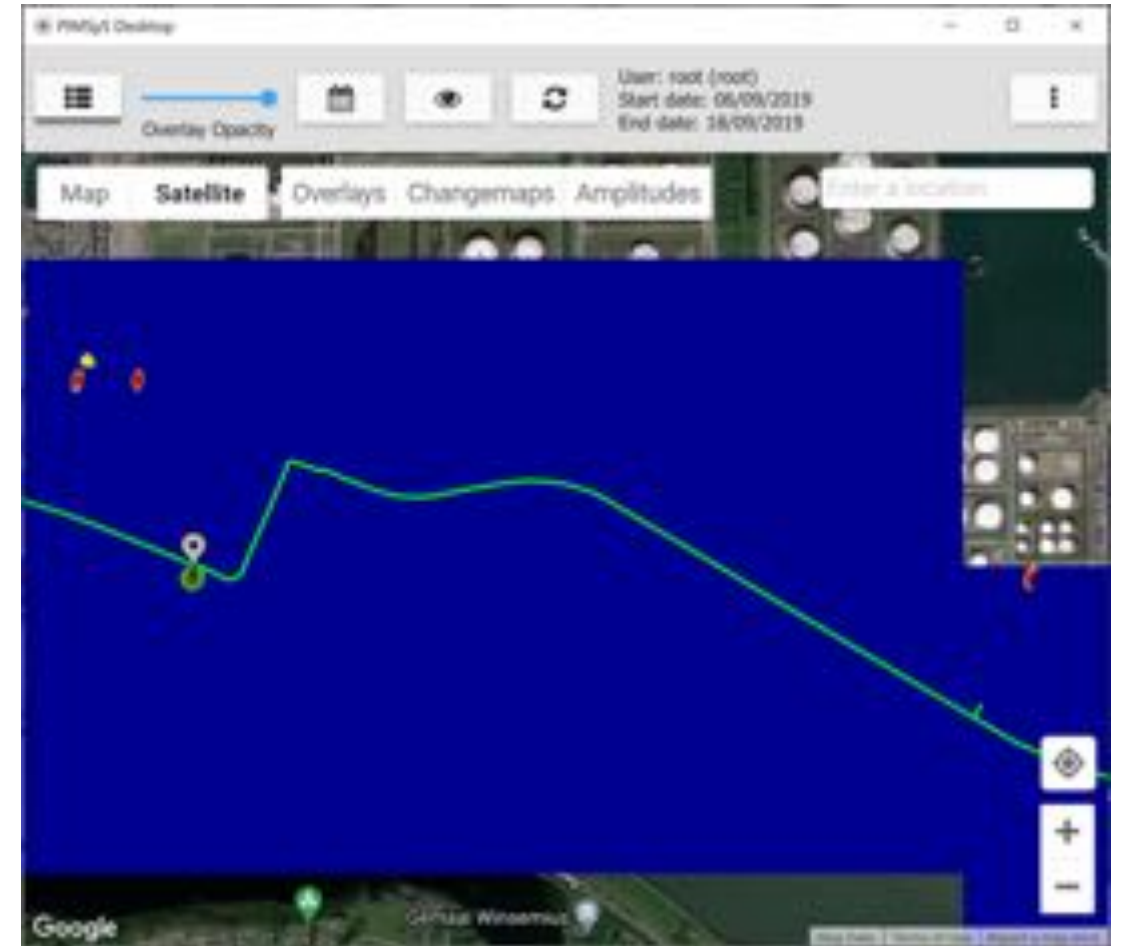


How does it work? – Discard irrelevant changes using filters and AI

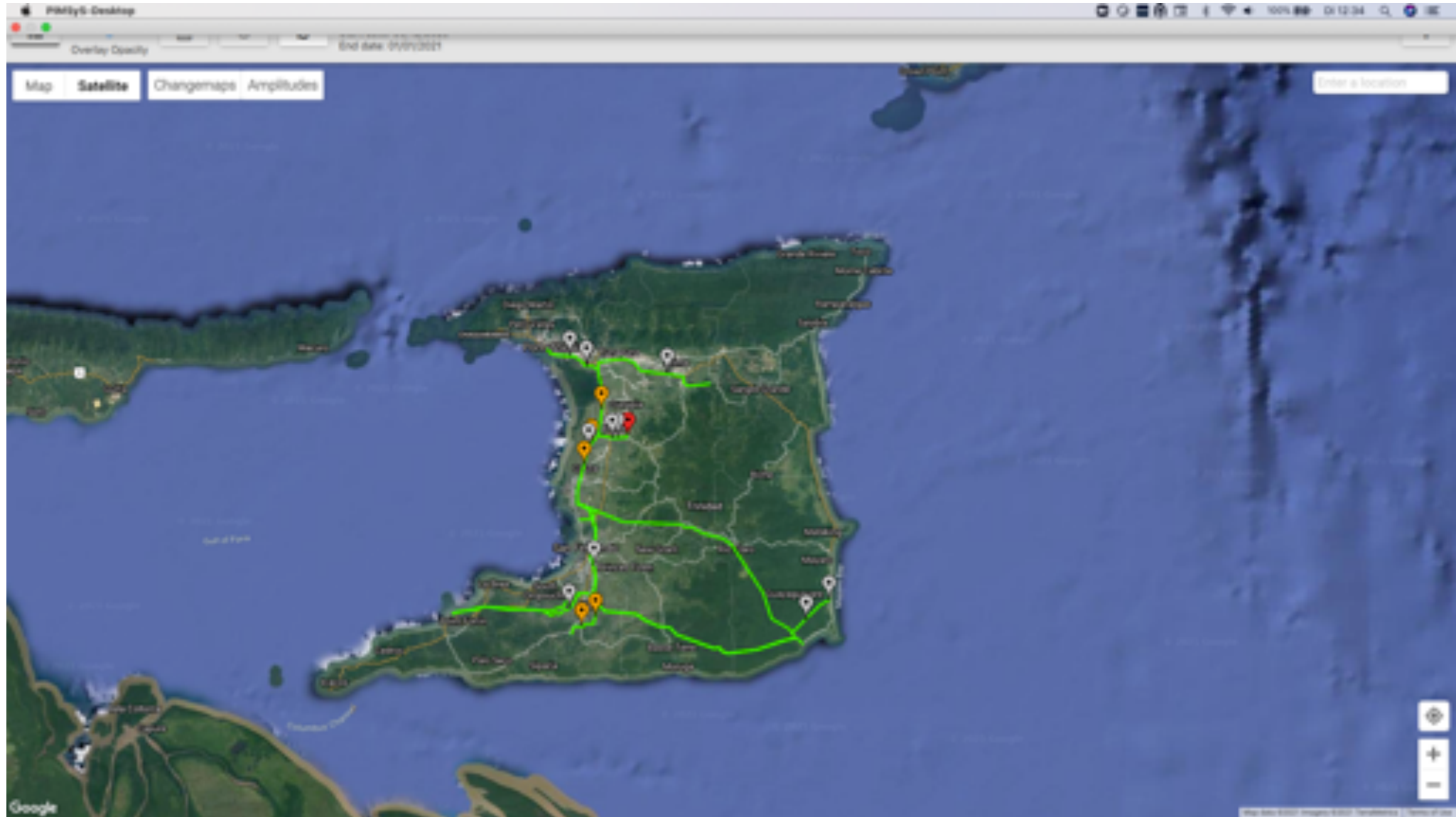
All changes



Changes after filtering



How does it work? – Inform Energy Grid Operator about activities



Contribution of satellite-based monitoring technology to safe transport of energy



Frequent monitoring and detection of activities in energy corridor



Reliable monitoring service



Sustainable

- Zero emission
- No flight incidents



Less incidents in energy grid

- Less accidents
- Less leakages
- Less harmful emissions

Challenges for implementing satellite-based monitoring technology

- Regulatory challenges
 - Regulation specifies monitoring method
- Spatial and temporal resolution of satellites
 - Continuously improving
 - ESA's Copernicus Programme⁵
- Conservative industries
 - Reluctant to change and innovation



Want to know more?



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References

1. <https://opwegmetwaterstof.nl/plan-voor-europees-waterstofnetwerk-gepresenteerd/>
2. De energietransitie uitgelegd – Sanne de Boer (2020)
3. <https://www.carbonbrief.org/scientists-concerned-by-record-high-global-methane-emissions>
4. European Gas Pipeline Incident Data Group (EGIG), *10th Report of the European Gas Pipeline Incident Data Group (period 1970 – 2016)*, Doc. number VA 17.R.0395 (March 2018)
5. https://www.esa.int/Applications/Observing_the_Earth/Copernicus/Overview3