

STUDY SUMMARY

Satellite data, key allies for energy network management

Fact sheet 3

What satellite data actually brings

Focus on 4 major uses in the energy sector

Satellite data is not a distant or futuristic concept: it is already being used to address very real challenges on the ground.

Each use case has its own available tools.



Where to electrify as a priority?

Before deciding where to lay a line or install a mini-grid, it's important to know where the real demand lies. Satellites can analyze topography, building density, vegetation cover, and more, and cross-reference this data with socioeconomic criteria.

Useful tools:

Open Energy Maps (MIT)

Estimates electricity demand building by building, even without a meter, using AI. Data available for Ghana, Senegal, and Uganda. **Free.**

CEAP (JRC)

Prioritizes areas for electrification by combining demand, environment, and socioeconomic factors. **Free.**

IRENA IEP

Generates realistic electrification scenarios (on-grid, mini-grid, off-grid) at the national level. **Free.**



How to better plan the network?

Satellites help locate existing infrastructure, choose the best routes, avoid risky or costly areas, and estimate the potential for renewable production (sun, wind, hydro).

Useful tools:



ESMAP

Offers interactive maps to simulate electrification scenarios, including those with storage or renewable energy. **Free.**



Microsoft Building Footprints

Prioritizes areas for electrification by combining demand, environment, and socioeconomic aspects. **Free.**



GIS Catalogue (IEA)

Generates realistic electrification scenarios (grid, mini-grid, off-grid) on a national scale. **Free.**



How to prevent natural risks around power lines?

Satellites make it possible to observe the environment of a network: relief, nature of the soil, flood zones, landslides, etc. This allows us to avoid building in overly exposed areas, or adapt the infrastructure accordingly.



Useful tools:



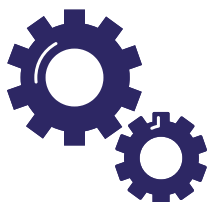
EGMS (Copernicus)

Ground movement alert and tracking tool across Europe and soon beyond. **Open data.**



ICEYE

High-frequency radar data is very useful for detecting natural hazards, even in cloudy or inaccessible areas. **Paid.**



How to monitor and maintain smarter?

Using a series of radar or optical images, it is possible to remotely identify vegetation that is too close to the lines, land subsidence, or defects invisible to the naked eye. This allows you to target the areas to be inspected, reduce maintenance costs, and prevent incidents.



Useful tools:



SAR/InSAR data

Used to detect millimetric ground movements (subsidence, instability of structures, etc.). Provided in particular by ICEYE or Sentinel-1.



Tailor-made solutions (e.g. KAYRROS)

Some startups offer combined satellite and AI analytics to monitor critical infrastructure. These are often paid or subscription-based.



To learn more about each of these tools, go to [**section Fact Sheet 6.**](#)