



DOWNSTREAM GATEWAY
Space for Earth

Space applications: catalysing sustainable innovation in the energy sector

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→ ESA SPACE SOLUTIONS



Zero-equity funding (from €50k to €2M+ per activity)



A personalised ESA consultant



Technical support and commercial guidance



Tailored project management support



Access to our international network of ESA and partners



Access to our network of investors

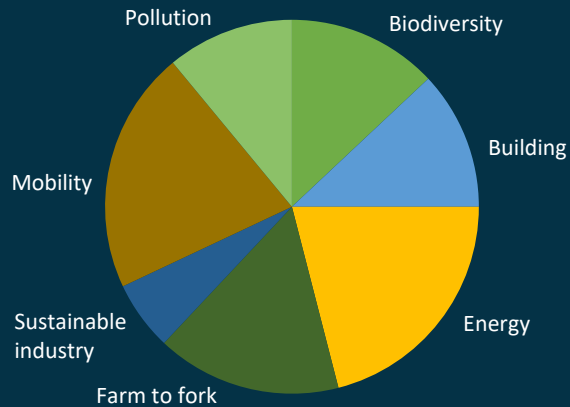


Credibility of the ESA brand



→ BASS ACTIVITIES ON ENVIRONMENTAL SUSTAINABILITY

- Over the last 10 years, ESA BASS programme has initiated circa 90 activities that relate to the EU Green Deal objectives.



Percentage of activities per thematic area

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Energy activities



ESA BA Energy Activities



- Hydro energy
- Wind energy
- Pipeline monitoring
- Bioenergy
- Environmental monitoring
- Energy efficiency
- Solar energy
- Carbon capture and storage
- Smart electricity grids and powerline monitoring
- Microgrids
- Financial services
- Electric vehicle

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Renewable energy

WHY DOES SPACE DATA MATTER?

The weather plays a huge role in the level of energy produced from renewable sources. This is where Earth orbiting satellite data can be utilised for maximum effect. Highly accurate weather forecasting will help solar, wind and hydro energy output predictions.



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Space in Wind Energy (examples)



Earth Observation

- Wind and wave forecasting
- Weather forecasting and prediction of extreme weather events
- Near to shore seabed characterization
- Site planning and development support
- Environmental impact studies



Sat Communication

- Offshore wind farm communication support
- Back-up for critical applications
- Support for mobile operations
- Easy and fast deployment



Sat Navigation

- Resources locations
- Support real time weather forecasting
- Monitoring of critical infrastructure
- Support to under water operation
- Unmanned vessels navigation

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ISSWIND

SUPPORTING SERVICES FOR THE WIND POWER INDUSTRY

- Wind resource maps: estimate wind farm potential revenues (bankability)
- Wind and wave hindcast databases (for site selection)
Short term weather and wave forecasts in support to wind farm maintenance and operations
- Wind Power production forecast



EO provides weather observation services (e.g.: EUMETSAT products)



GNSS near real time observations to extract atmospheric parameters (e.g. stratified relative humidity) to improve weather forecasting models

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Forecast for Broad Cove

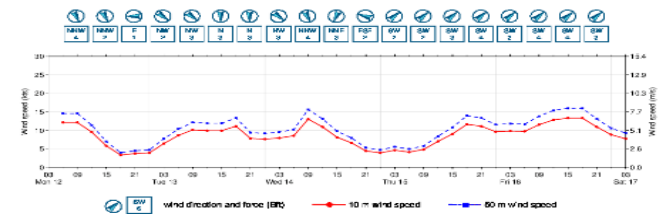


Summary
Issued at: Mon 12-May-2014 06:33
Valid for: Mon 12-May-2014 06:30
 All times in local time (UTC-2:30)
Location: 47° 42' 58" N, 53° 38' 41" W
Forecaster: Alice Lemk

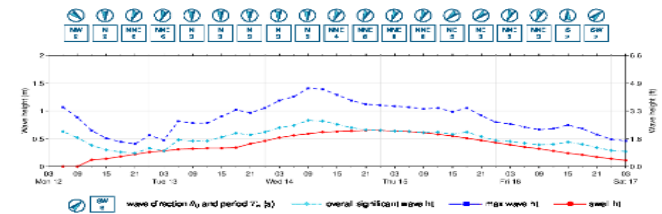
Warnings (24 hours)
Risk fog:
 Chance of low visibility: **medium**
 Chance of lightning: **none**

Contact: (847) 741-4100
 Fax: +1 (815) 445-1100
weather@argos.com
www.bmtweather.com

Wind charts



Wave charts



For an explanation of the wind and wave parameters, please refer to http://www.bmtweather.com/forecast_LBuEBn.pdf

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<https://business.esa.int/projects/isswind-demo>



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Comm4Offshore : Interactive communication and monitoring system for offshore wind energy.



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business.esa.int/projects/com4offshore



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Comm4Offshore

Interactive communication and monitoring system for offshore wind energy

One Stop-Shop for optimised communication solution and monitoring operations, providing:

- Stable and low cost broadband (i.e Ka/Ku) communication for vessels and wind farm platform
- Cloud based interactive communication and monitoring systems
- Flexible data recording via application user interface and Data Analytics for improved operations and strategic decision
- Business support services



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business.esa.int/projects/com4offshore



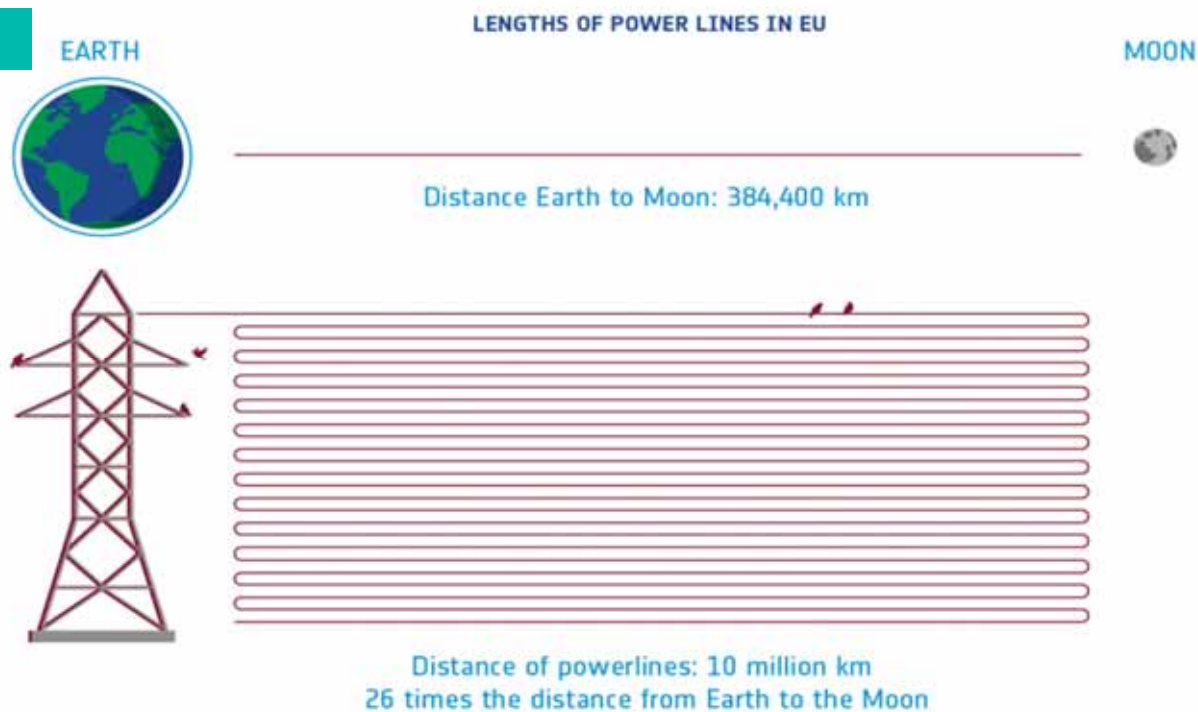
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Monitoring of critical infrastructure

WHY DOES SPACE DATA MATTER?

- An overview of localised conditions and changes throughout vast land areas or cities over time is vital in the continuous maintenance and operation of these services. This is only possible as a result of satellite technology.



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Vegetation monitoring

WHY DOES SPACE DATA MATTER?

- Earth Observation optical and Earth Observation SAR data provide information on: tree species & height estimation, determination of the position of trees with respect to power lines. By knowing the tree specie and environmental condition (including weather), a prediction of vegetation growth can be modelled.



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ESA, EDSO and ENTSO-E announce cooperation agreement

Home » News Archive » ESA, EDSO and ENTSO-E announce cooperation agreement



<https://business.esa.int/news/esa-edso-and-entso-e-announce-cooperation-agreement>

Using satellite technology to optimise the power grid

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Space supporting transition to greener energy



Space-based services for distributed energy networks

Technical feasibility and economic viability of space based applications for *Smart Grid* and electricity grid maintenance & operations addressing: smart grids, electricity grid maintenance, technology enablers

Stakeholders involved through ESA: European Network of Transmission System Operators for Electricity (ENTSO-E) , European Distribution System Operators for Smart Grids (EDSO) , Global Smart Grid Federation (GSGF) , Friends of the Supergrid (Supergrid)



Four feasibility study contracts were awarded in response to the ESA ITT, led by: **GMV UK**, **Headpower (FI)**, **StormGeo (NO)**, **i-EM (IT)**. Throughout the feasibility studies, ESA facilitated regular interactions between consortia and stakeholders.

Demo project(s) in preparation.

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Space Technology lights up developing countries

Space for microgrids

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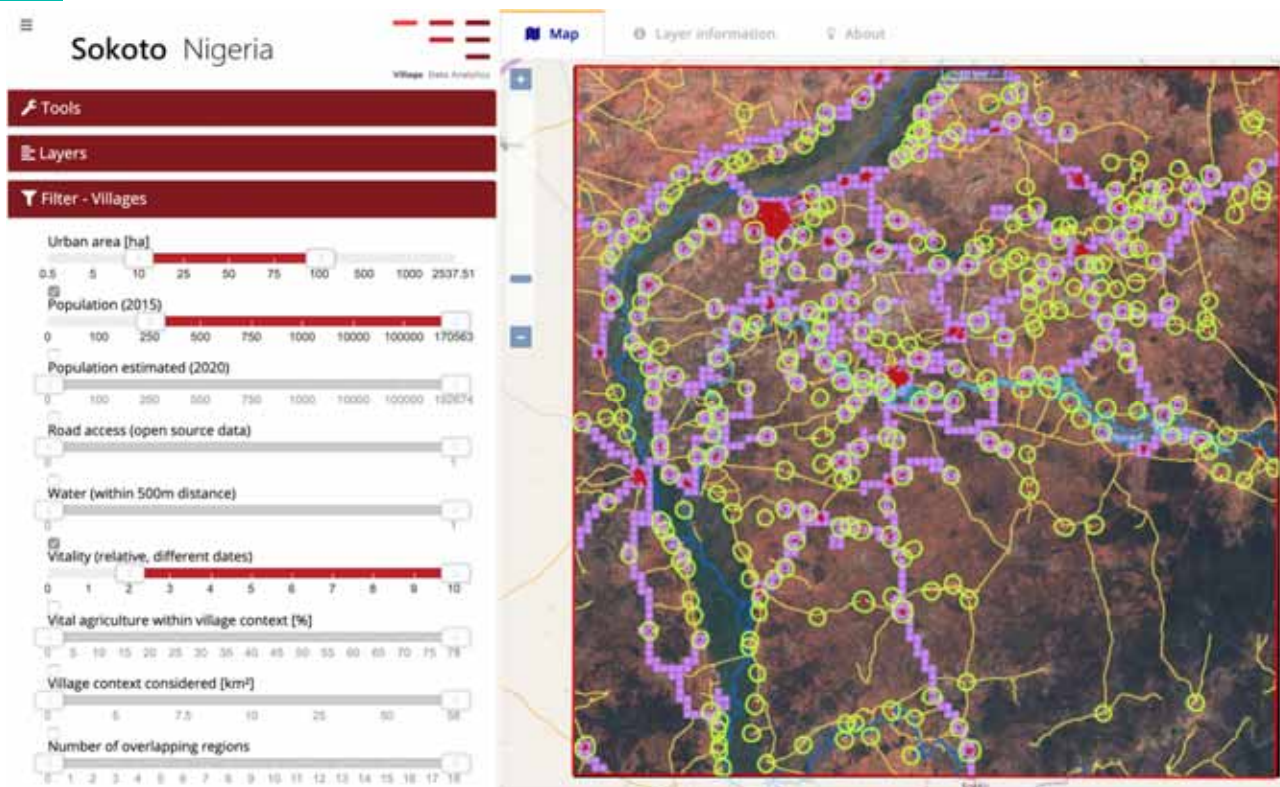
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Village Data Analytics

VIDA provides summary statistics about settlements in a defined region of interest. The result is an intelligent map showing the best sites for rural electrification through microgrids.

- Village size and demographics
- Road network analysis
- Vegetation analysis
- Water body analysis
- Survey analysis
- Energy modelling



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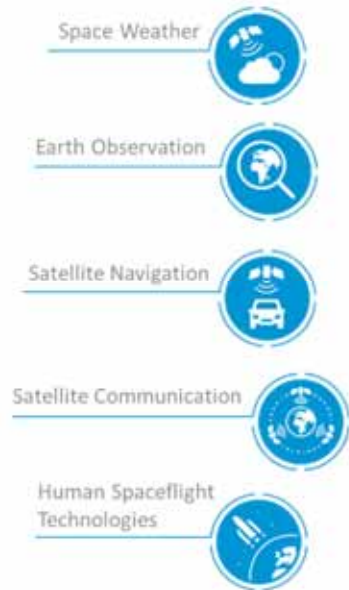
<https://business.esa.int/projects/village-data-analytics>



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INNOVATIVE TECHNOLOGIES

Space technologies



- UMS
- HAPS
- RPAS
- VR/AR
- 5G
- IoT
- Artificial Intelligence
- Megaconstellations
- Cybersecurity
- Blockchain



Users and markets



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What's next?

Planned initiatives

- Space applications and tech in support **circular economies** enabling transition to greener energy
- Renewable energy initiatives powered by space, addressing **new clean energy economies**
- Support **sustainable rural electrification** through space applications
- Support technical and business innovation towards greener energy through **space-based breakthrough technologies**
- Facilitate export opportunities to EU industry through **international partnerships**



Space to advance innovation on circular cities



- ESA Space Solutions is planning to issue an **announcement of opportunity** for a feasibility study to assess technical and business feasibility of using **space** assets to advance **business innovation** in **circular cities**.
- The opportunity, supported by ENEL, would cover two main areas of interest: **public transport transition towards zero carbon** and **dynamic mapping system of infrastructures**.



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A photograph of an industrial facility, likely a power plant or refinery, at dusk. The scene is dominated by a complex network of yellow and blue metal structures, including scaffolding, walkways, and pipes. Several tall, white, cylindrical chimneys or smokestacks rise into the sky. The sky is a deep blue with some light clouds. The overall atmosphere is industrial and somewhat somber due to the twilight lighting.

→ DECOMMISSIONING OF ENERGY ASSETS POWERED BY SPACE

Funding up to €200K per Activity
Opens 2nd Quarter of 2020

→ FUNDING & SUPPORT OF SPACE-BASED SERVICES FOR MARINE ENERGY SOLUTIONS

100% Funded by ESA, up to € 150K per Study

Application Deadline: 27th October 2020

Webinar: 15 September 2020 - 11:00 CEST



<https://business.esa.int/funding/intended-tender/marine-energy>



ESA Space Solutions

→ SPACE IS OPEN FOR BUSINESS

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