



Liveable Cities through Climate-Resilient Management Using Satellite Data

Spatial Business Integration GmbH
www.spatial-business-integration.com

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Role of the “Green Lung” in the Urban Environment



Source: Russo & Cirella (2019)

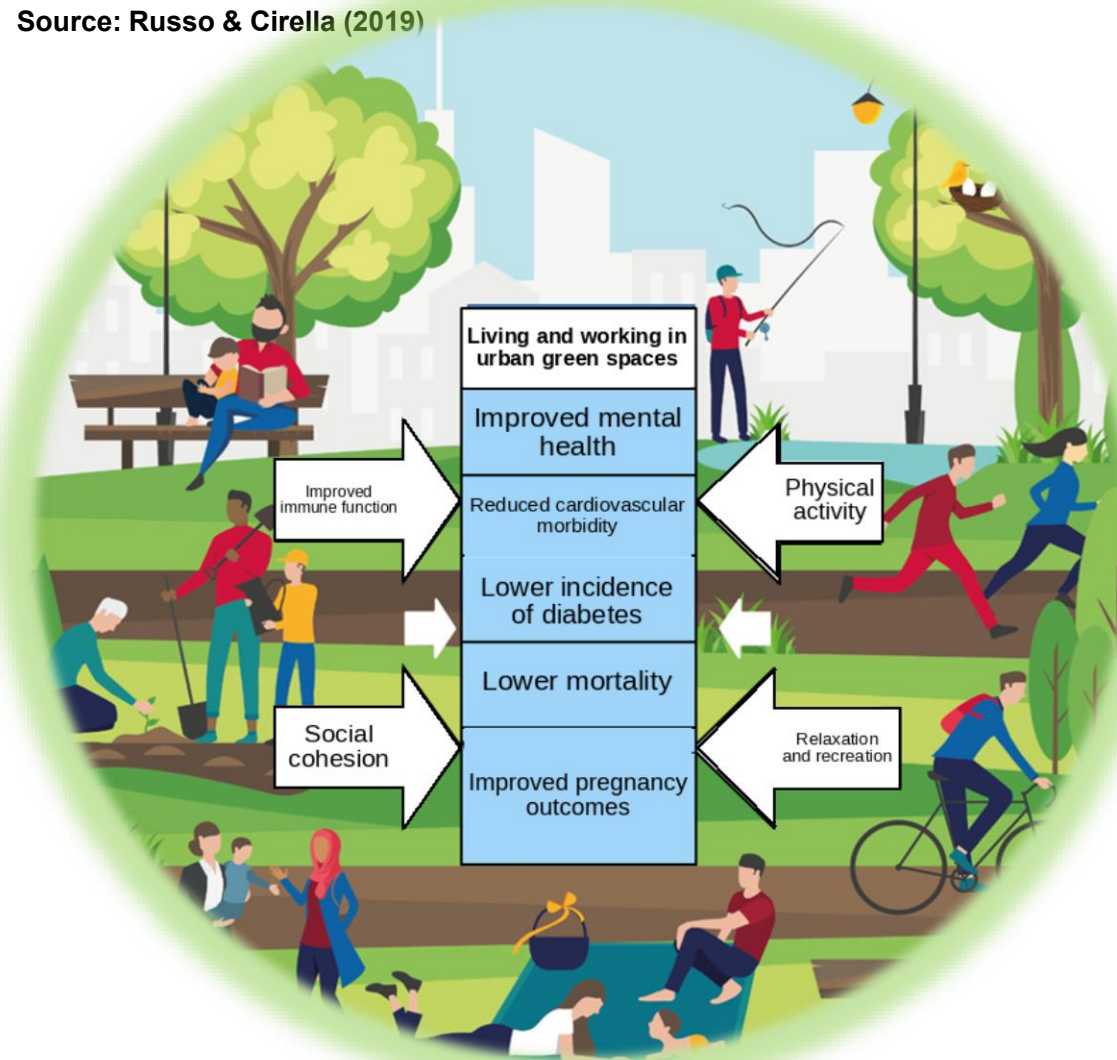


IMAGE: Frankfurt Convention Bureau



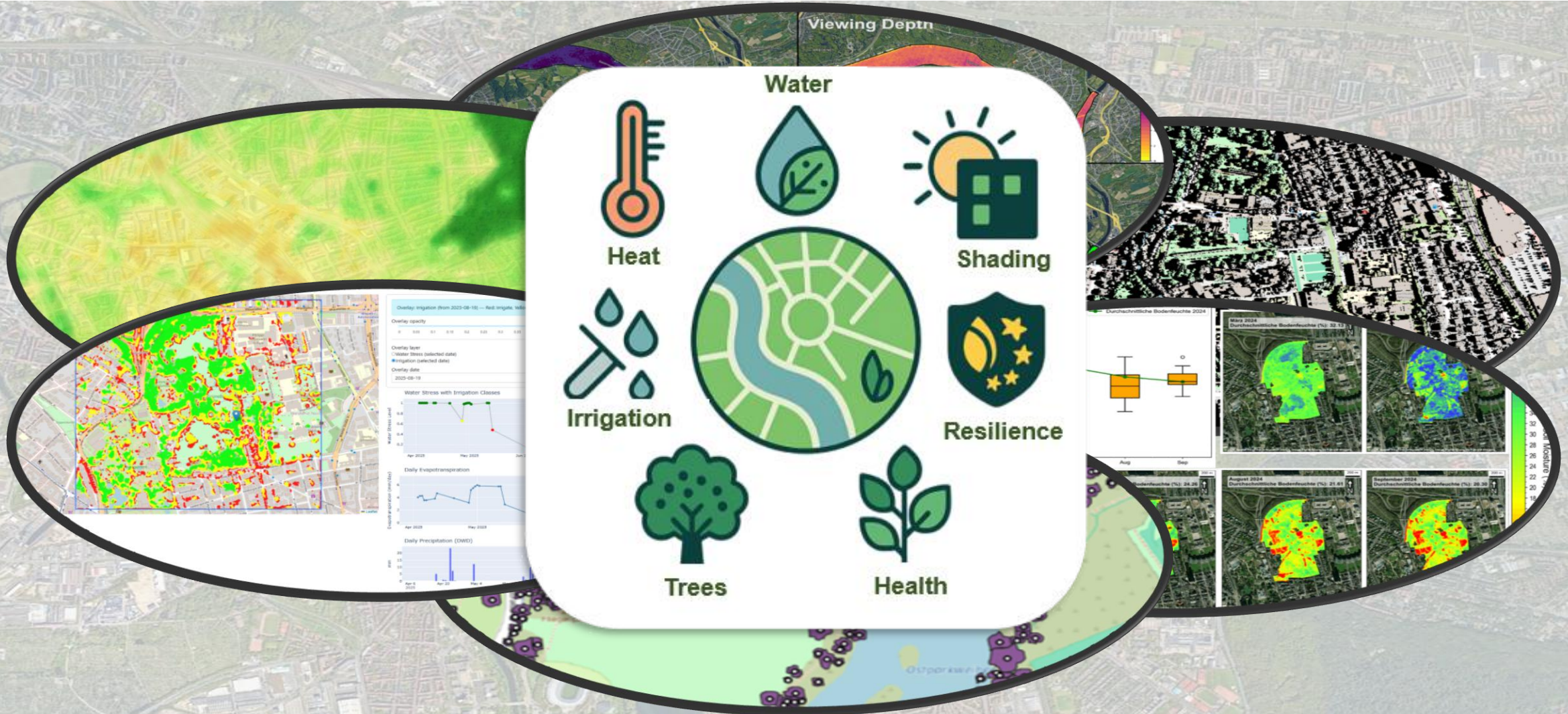
Feedback



Irrigation
Fertilization
Water Monitoring
Resilience
Shading
Subsidence

Land-use	User needs	Prio	S1	S2	S3	S4	S5	S6	Remark
Grass and lawn areas	Growing height	1				○			Service has been defined to TRL 3 and needs to be assessed
	Biomass					●			Thematic requirements are met, but not the required minimum mapping unit
	Greenness					●			Thematic requirements are met, but not the required minimum mapping unit
	Soil moisture		●						
	Fertilisation			○					Service has been defined to TRL 3 and needs to be assessed
	Shading degree		●						
Sport facilities	Greenness	2				●			
	Fertilisation			○					Service has been defined to TRL 3 and needs to be assessed
	Soil moisture		●						
Urban forest and street trees	Single tree delineation	1				●			
	Tree height					●			Accuracy of +/- 3.7 m is not acceptable
	Crown diameter					●			
	Greenness					●			No reliable conclusions can be drawn about the greenness of the tree via stem water potential measurement
	Damage					○			Service has been defined to TRL 3 and needs to be assessed
	Tree density					●			Services fulfills the requirements just for the upper canopy layer. Information about the lower layer is needed
	Irrigation		○						Service has been defined to TRL 3 and needs to be assessed
Water bodies	Chlorophyll-a concentration	2			●				
	Water temperature				●				
	Viewing depth				○				Service has been defined to TRL 3 and needs to be assessed
	Surface Algae Blooming Index				●				
	Forecast surface algae bloom.				○				Service has been defined to TRL 3 and needs to be assessed
Playgrounds	Shading degree	3					●		Services fulfills the requirements but not anymore needed (City of Essen)
Subsidence	Change of position/height	opt.						●	Shift in position in all directions should have to be considered.

● Compliant ● Partially compliant ● Not compliant ○ Compliance to be assessed



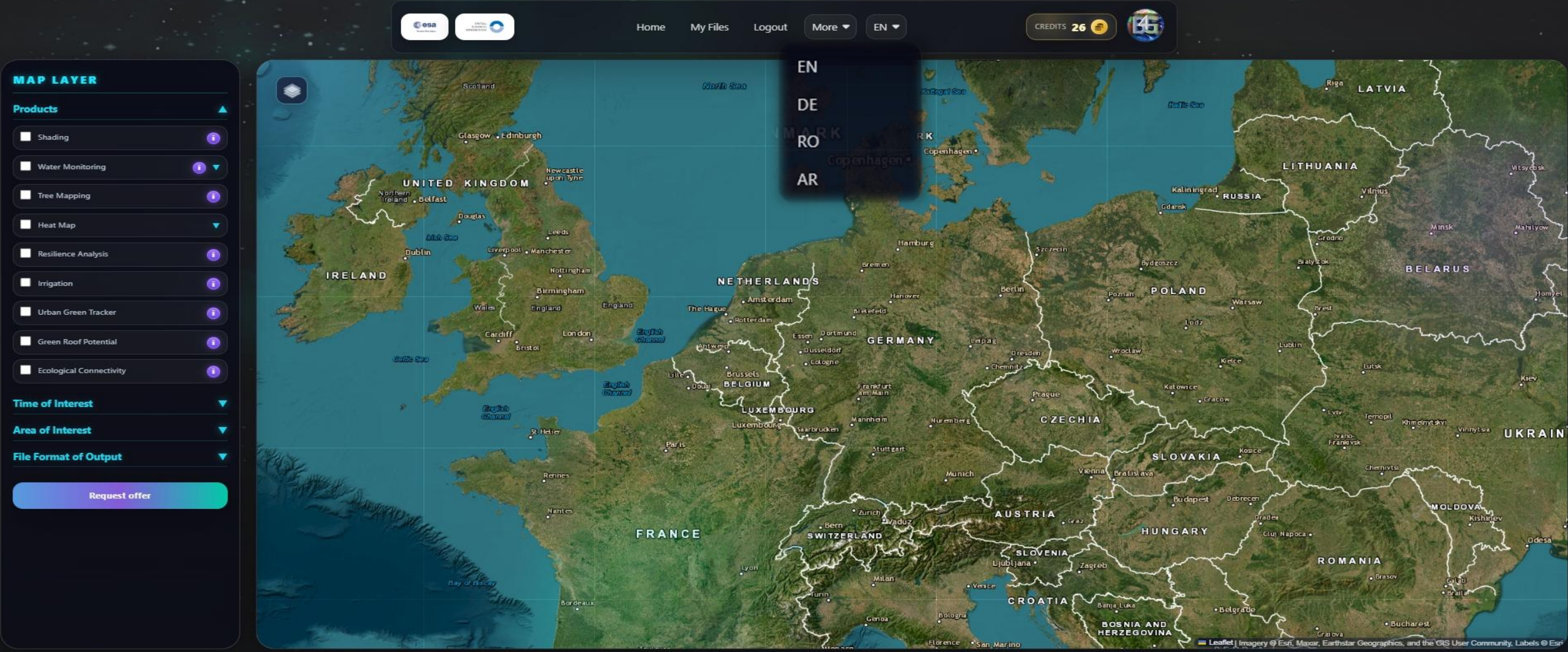


BLUE4GREEN

AERIUS

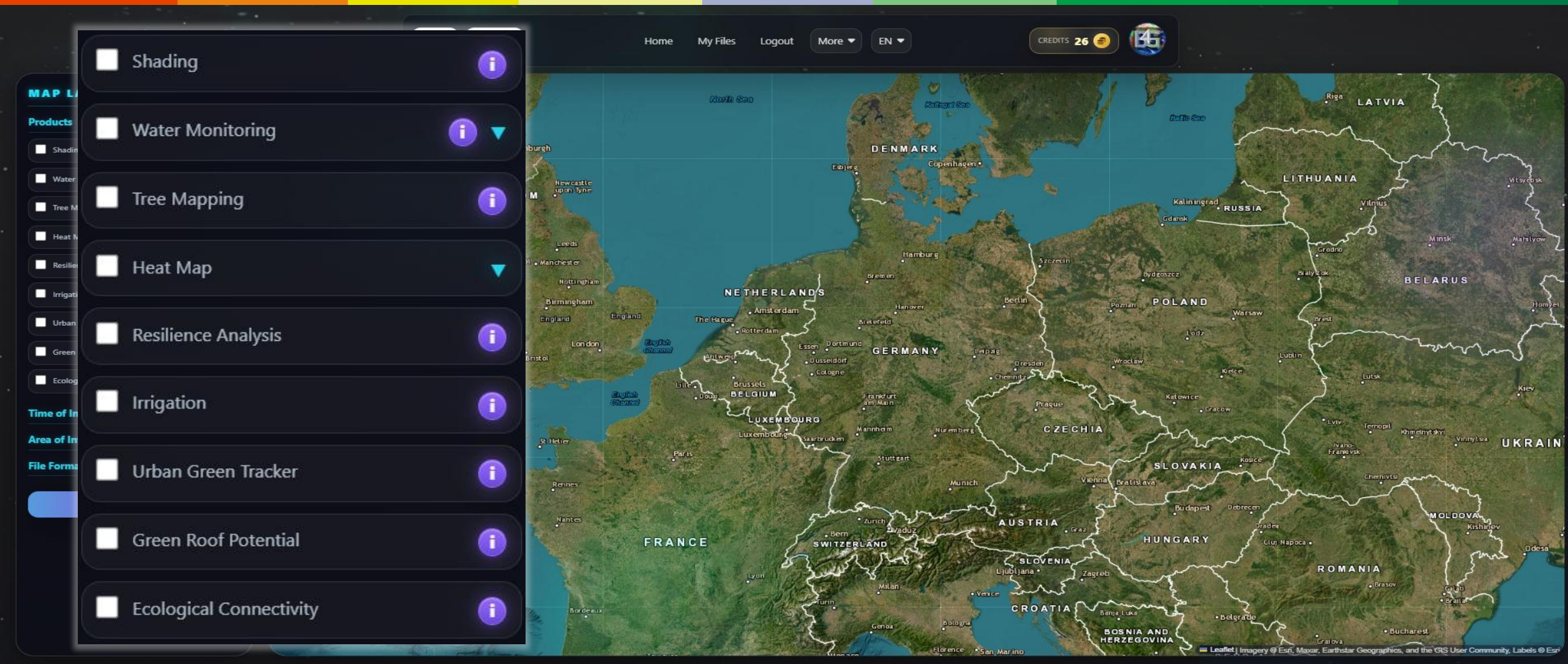
100%

Blue4Green Homepage



Blue4Green Services

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Requesting a Service



MAP LAYER

- Products
- Time of Interest
- Area of Interest
- File Format of Output

Products: Shading 1

Products

- ☒ Shading
- ☐ Water Monitoring
- ☐ Tree Mapping
- ☐ Heat Map
- ☐ Resilience Analysis
- ☐ Irrigation
- ☐ Urban Green Tracker
- ☐ Green Roof Potential
- ☐ Ecological Connectivity

Area of Interest 2

Area of Interest

- ☐ Upload AOI
- ☒ Draw AOI

TOI: Select Date (2025-08-20) 3

Time of Interest

☒ Select Date: 20.08.2025

File Format of Output: Shapefile 4

File Format of Output

- ☒ Shapefile
- ☐ GeoJSON

Review your request 5

Area of Interest (AOI)	Draw AOI (116.85 ha)
Products	Shading
Time of Interest (TOI)	Select Date (2025-08-20)
File format of output	Shapefile

Service	TOI	Credits
Shading	Select Date	5
Available credits		50
Credits to be deducted		-5
Remaining after submission		45

Please confirm these selections or go back to adjust them.

[Back & edit](#) [Confirm & submit](#)



Sample Maps

Different countries, different services

Water Monitoring

Water Monitoring Dashboard

Select layer and date. Hover the map to inspect values.



OVERLAY CONTROLS

Layer

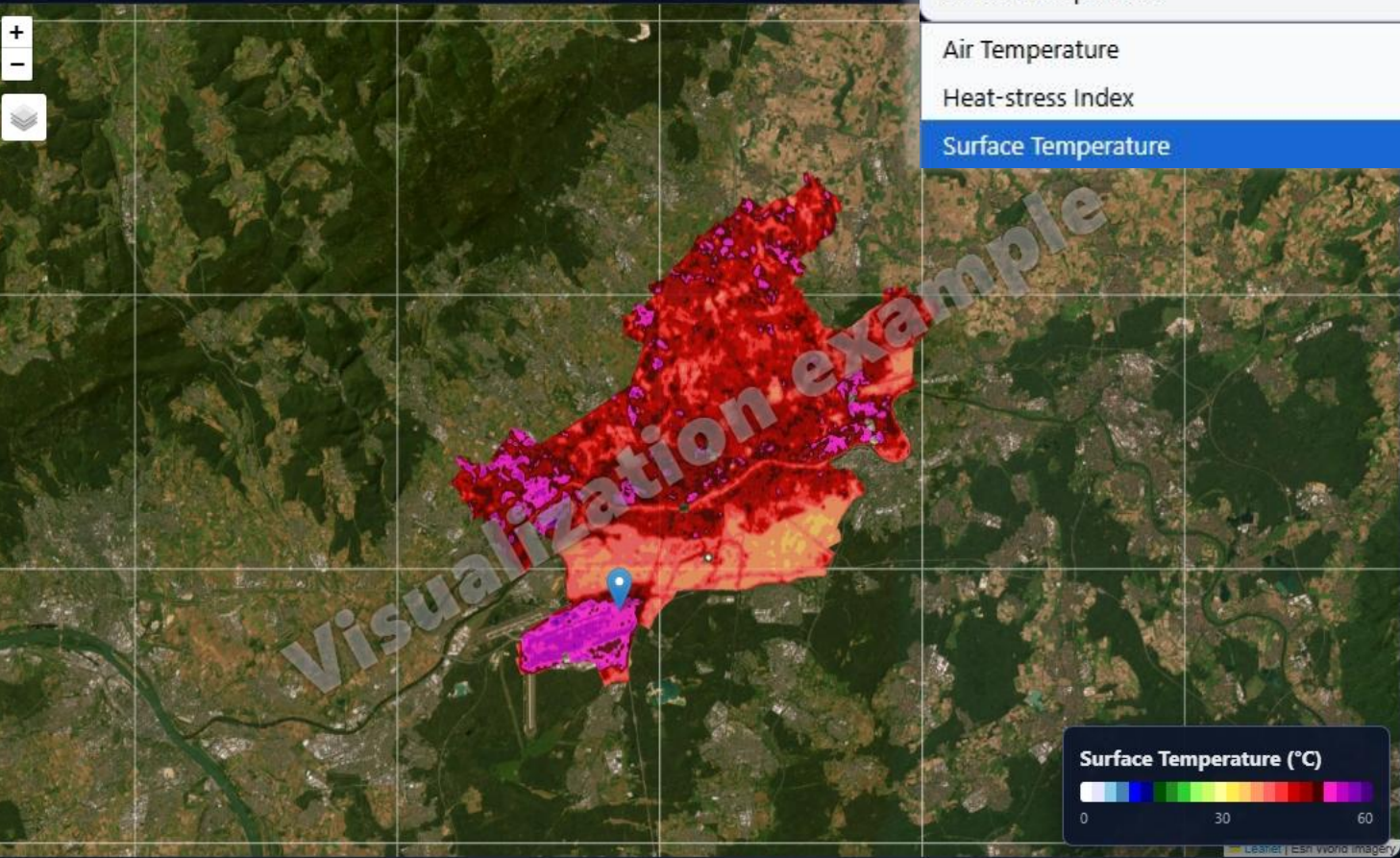
Viewing Depth

Satellite/Sensor	Sentinel-2A MSI
Spatial Resolution (m)	10 m
Minimum(°C)	0.002
Maximum(°C)	1.720
Median(°C)	1.042
Mean(°C)	1.057
Standard Deviation(°C)	0.222
Valid Pixels	48,088
Percent Coverage (%)	99.04 %

Heatmap

Historical Temperature Difference Dashboard

Select an overlay mode and variable. Click on the map to get a pixel-based time series.



Layer

Surface Temperature

Air Temperature

Heat-stress Index

Surface Temperature

Overlay date

2025-08

Temperature and Vital Biomass Timelapse

Temperature and Greenness Timelapse (50.04690, 8.58569)



Resilience: Detecting unhealthy plants

RESILIENCE ANALYSIS DASHBOARD

Switch analysis layers and explore resilience trends over time. Click on the map to get a pixel-based time series.



Type of Analysis

- Plant Vigor Analysis
- Plant Growth Analysis

Overlay Layer

- Indicator's Monthly Average
- Plant Vigor: Yearly Average

Year

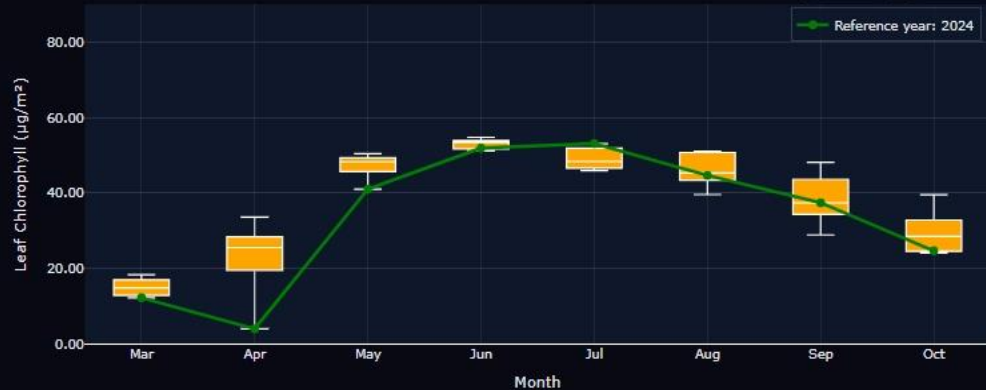
2024

lat=51.450156, lon=6.971152

Time Series

CSV

XLSX



Irrigation: Yes/Cautious/No

IRRIGATION MONITORING DASHBOARD

Click inside the map to view pixel-based water stress, vegetation density, water use, and irrigation recommendations over time.



OVERLAY CONTROLS

Overlay: Irrigation — Red: Irrigate, Yellow: Caution, Green: Do not irrigate

Overlay layer

- Water Stress (selected date)
- Irrigation (selected date)
- Evapotranspiration (selected date)
- Vital biomass

Overlay date

2025-09-17

WATER STRESS TIMELAPSE



WATER CONSUMPTION TIMELAPSE



VEGETATION DENSITY TIMELAPSE



Green Roof Potential

Green Roof Potential

Single GeoTIFF overlay with a single legend. Adjust overlay opacity.



Green roof potential

LAYER

Greening Potential (Slope Classes)

CLASS DISTRIBUTION (AREA)

Very well suited (0-5°):	7 995 095 m²
Well suited (5-10°):	1 047 880 m²
Still suitable (10-15°):	707 245 m²
Not suitable (>15°):	5 252 840 m²

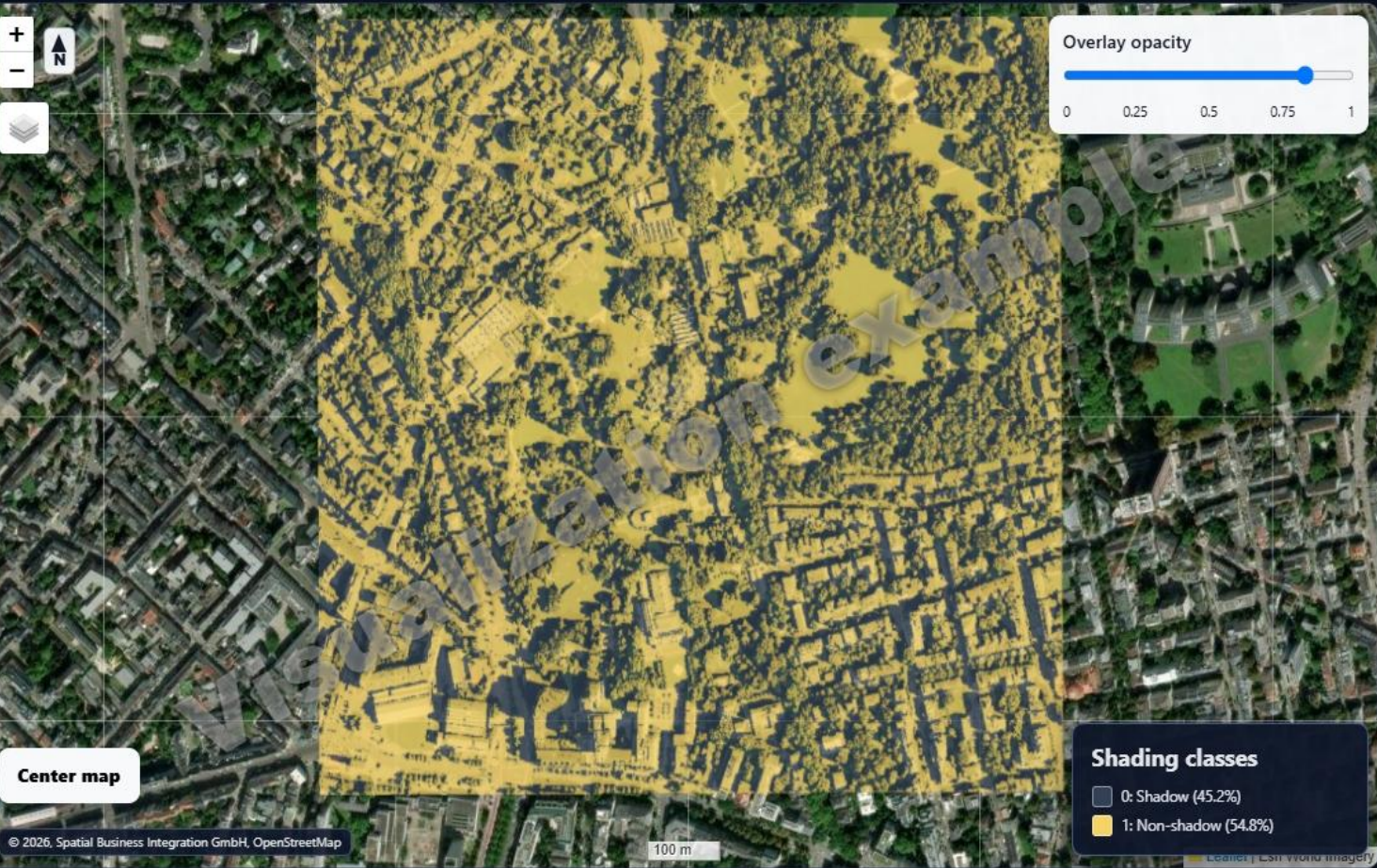
TOTAL ROOF AREA (AOI)

In total:	15 003 060 m²
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Shading

Shading Dashboard

Select area, date, and hour. Hover the map to inspect shadow classes.



OVERLAY CONTROLS

Area

Grünburgpark

Date

2025-09-05

Hour

09:00

General information

Grünburgpark	
Selected hour: 09:00	
Area	Grünburgpark
Selected date	2025-09-05
Selected hour	09:00
Indicator	Shading
Date	15.08.
Time	09:00
Spatial Resolution (m)	1
Shaded Area (km²)	0.51
Shaded Area (%)	51.1 %

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Tree Mapping

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Simple, Flexible, Usage-Based



Pay for what you use:

With transparent credit costs shown before each analysis.

- Credits belong to the organization — the whole team shares one balance.
- Purchased credits are normally valid for 12 months.
- Credits are generally non-refundable and non-transferable.
- Technical errors on our side: the job is repeated or credits are restored.

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EARTH OBSERVATION FOR A SUSTAINABLE FUTURE

Blue4Green

Satellite data for greener, climate-resilient cities

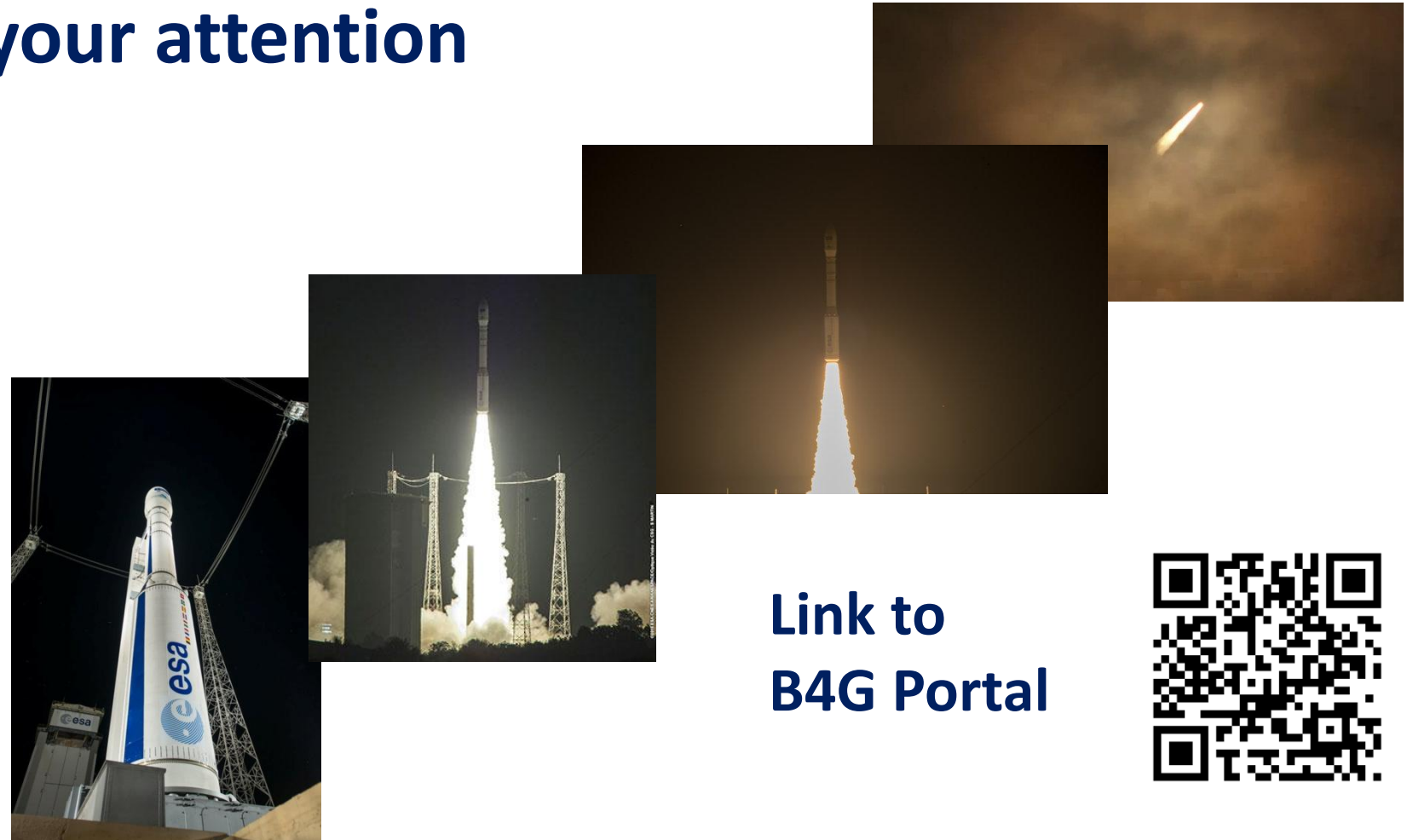
Our analyses help municipalities steer maintenance, planning and climate adaptation more precisely, efficiently and transparently.

 **Get 50 free credits when you register**





Thank you for your attention



**Link to
B4G Portal**



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