

SPACE FOR TWIN CITIES GREEN AND SUSTAINABLE CITIES



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Roberta Mugellesi Dow - ESA



ESA SPACE SOLUTIONS

The largest space innovation network in the world

- The go-to place for great business involving space to improve everyday life.
- Supporting European start-ups and SMEs to develop businesses using space technology and data.
- Offering funding, business and technical support to help to generate successful business and create jobs.



ESA SPACE SOLUTIONS OFFERS



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

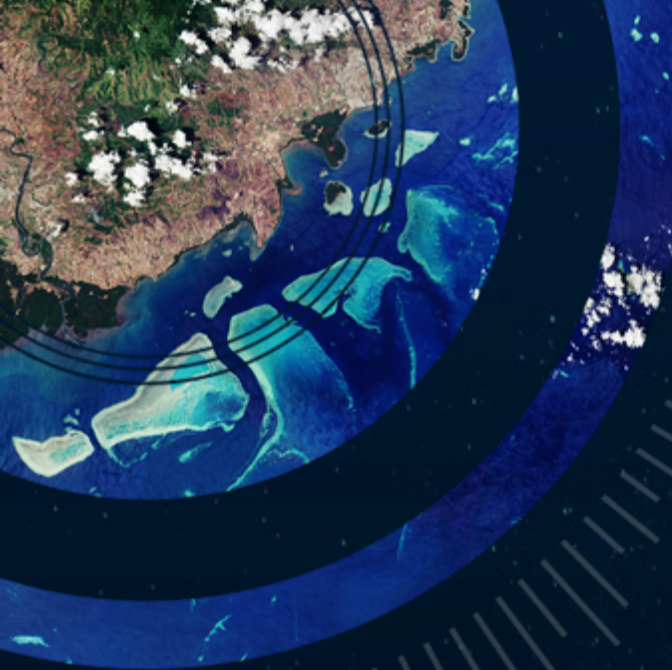


Access to our network
of investors



Credibility of the
ESA brand





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An aerial photograph of a dense urban landscape, likely New York City, showing a vast number of skyscrapers and buildings. A prominent green park area is visible in the center of the city. The text "Next step...." is overlaid in the top left corner.

Next step....

Cities need to be redesigned, reinvented..



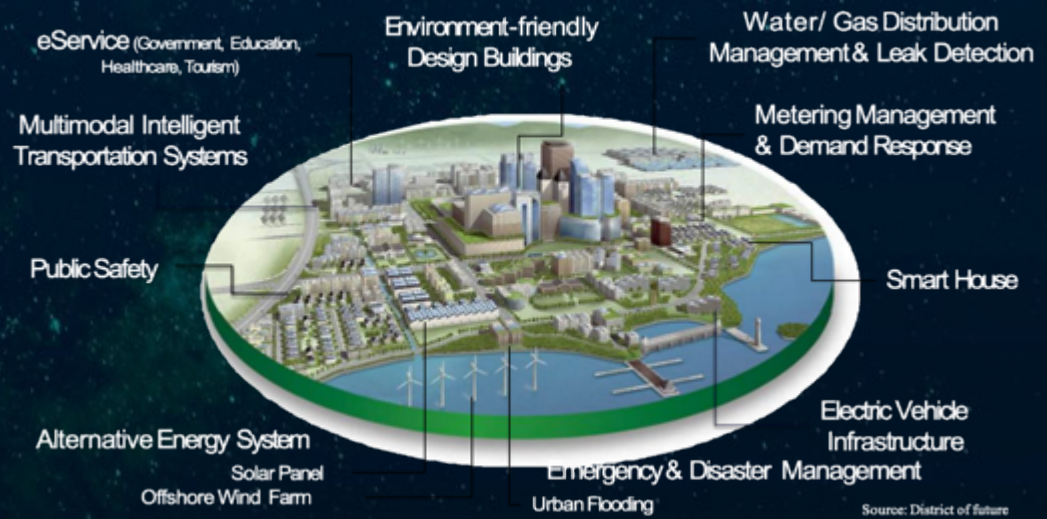


11.1	Safe and affordable housing and basic services
11.2	Safe, sustainable transportation systems
11.3	Inclusive urbanization and participatory, integrated planning
11.4	Cultural and natural heritage
11.5	Resilience to disasters
11.6	Reduced environmental impact of cities
11.7	Green and public spaces
11.A	Rural-urban linkages
11.B	Comprehensive disaster risk management
11.C	Financial and technical support for sustainable and resilient buildings

SDG 11 Sustainable Cities and Communities



What are the needs for developing a smart city in the future?



Source: District of future
<http://www.districtoffuture.eu/>

Green and Public Spaces

Cities are going digital: the natural capital upon which cities rely risks being left behind by the digital revolution.

Green infrastructure such as urban parks are critical components of urban sustainability and resilience.

The quality of urban life and the functioning of the city depend on the quality with which the cities are shaped, restructuring and transforming toward a sustainable model.

Need to consider whether and to what extent urban trees and other green spaces can be effectively be integrated into smart city planning, to maximize benefits for all citizens.

- During the pandemic, there has been an increase of mobility into green spaces and public gardens for physical exercise and mental calming.
- UN estimates every week, 3Mio people move to cities

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Objectives of Urban Green Initiative

Define innovative space-based applications in support of the development and implementation of urban green solutions

- technical feasibility & economic viability assessment
- roadmap for services implementation definition
- follow-on demonstration project preparation

€ 200K per study (100% funded) - duration 9 months

Tender opening on Q3 2021

In collaboration with European Cities



Planning & Design

Sustainable Development

Urban green indicators

Examples of Services

Planning & Design

- The design and planning requirements
- Impact on human health and quality of life
- Biodiversity

Sustainable Development

- Assess changing status of green areas
- Sustainable development of the urban green space
- Assess the use of the green areas and the societal added value

Urban Green Indicators

- Characteristics
- Impact on air quality
- Accessibility



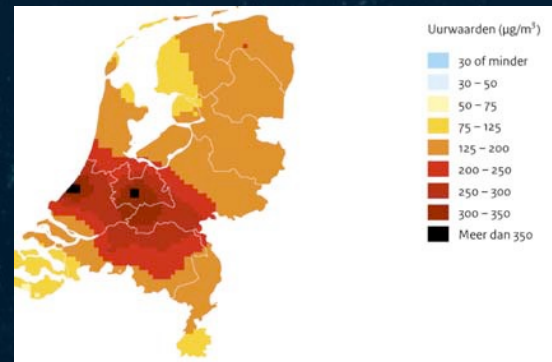
Diagram illustrating a Green House with various sustainable features:

- Alternative energy source for electricity - Photovoltaic panel on the south side
- Building with trees shaded on east and west
- Metal/light colored roofing
- Energy efficient, low E windows and glass
- Light colored exterior walls
- Alternative energy source Solar Panel - water heater
- Low flow and dual flush toilets
- Duct work sealed with mastic
- High quality insulation and sealing
- Minimal carpet use
- Carbon monoxide alarm
- Large overhangs
- Low/zero "VOC" flooring and paint
- ENERGY STAR Appliances and light fixtures
- Central dehumidification system
- Properly sized mechanicals
- Safe Room
- Central vacuum system
- Native plantings
- Rain Water Collection

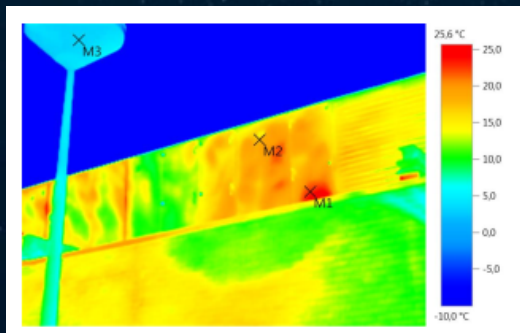
Examples of Services



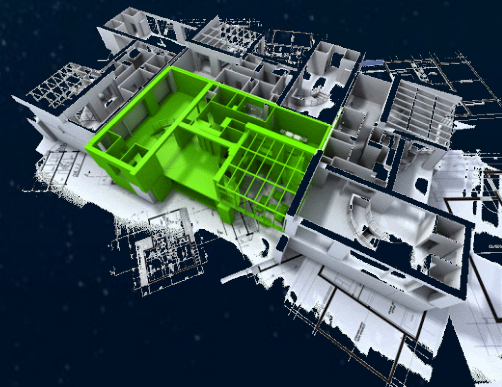
Service to monitor outdoor air pollution (CO₂ and N) for inside ventilation, using 5G and space data. In partnership with the Advanced Climate Systems providing measurement and control solutions for utility buildings



Service to monitor thermal leaks in buildings and to identify technical malfunctioning of installations so these can be solved, using 5G and space data.



Service to site selection of new construction, it is essential to analyse the site's natural surroundings (sun, soil, wind, water, and trees) as well as the surrounding built environment (buildings, roads, and local transportation options) .



Growing energy demand in cities

- Air conditioners and electric fans account for about 10% of all global electricity consumption.
- This figure is set to triple by 2050 equal to current electricity capacity of USA, EU and Japan.
- Number of air conditioners in buildings projected to grow from 1.6 billion to 5.6 billion by 2050



Sustainable and Green Buildings

Vertical gardens





Satellite Navigation

- GNSS are the main source of geo- referenced locations data.
- Satellite navigation is instrumental to locate where the emissions measurements are taken and generated, for RPAs and HAPS, geo-tagging services for data collection.



Satellite Communications

- will safely and securely relay information in the absence of terrestrial communications or in case of terrestrial network failures.
- provides broadband internet, voice over IP, real-time video and reliable communications
- facilitate broadcasting of new content requiring high-speed, low-latency services to enable real-time video.



Earth Observation data

- provide imagery for the maps required by models and simulations.
- systems (GIS) are allowing for geographical analysis and compelling visualisations. These can be used, for example, in creating urban simulations and assessing the impact on environment and population.

5G networks including terrestrial and satellite components will have a key role for delivering the high amount of data required by the applications with the required low latency, eventually also in real time (support to operations).

- For more information, please visit :

business.esa.int



THANK YOU!

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