

2018 BROCHURE

SATELLITE-BASED EARTH OBSERVATION

Market Prospects to 2027

11th Edition | A Euroconsult Research Report

The only source for comprehensive industry analysis & forecasts in the growing EO sector

Strategic issues & forecasts – detailed value-chain analysis – EO data demand – Breakdown of application sectors within each region – consolidated forecasts per application sector & per region

- ✓ **Comprehensive digital files**
- ✓ **Over 1,000 data points**
- ✓ **Priced at 6,000 euros**

The commercial EO data market could reach \$2.4 billion in 2027, driven by a mixture of defense and new commercial markets and supported by the arrival of new constellation operators. The EO market for value-added services (VAS) should reach over \$5.7 billion by 2027; potential new service areas with entrants focusing on developing constellations to support high-frequency change detection could even see the VAS market reaching \$9 billion in our upside scenarios.

For this new edition, we have revisited our market estimates and forecast methodologies in this fast-changing environment, deepening our bottom-up analysis.

Euroconsult has identified approximately 15 companies that have announced intentions to develop low-cost constellations based on smallsat technologies. This has been aided by the advancement in several areas such as miniaturization of components, enabling the development of more capable satellites at a lower mass. We anticipate the launch of nearly 1,500 smallsats (most of them below 50kg) to serve EO applications and see the years 2020-2022 as a major transition period. While new constellations being put forward are predominantly optical, SAR solutions and even hyperspectral or video are also now emerging.

The advent of new cost-efficient solutions collecting data at a higher frequency rate should transform services generation and delivery. Optimized analytics and increasing use of artificial intelligence, being pushed by both start-ups and established players, should contribute to an increase in the value proposition, and to the enlargement of use cases for satellite-based data.

Under this approach, location-based services (LBS) and finance are relatively new markets with a large potential – the two combined could represent a revenue opportunity of more than \$2 billion in 2027. LBS markets are built around the monitoring of specific point targets; the finance sector is similar in the change detection analytics being built, but with a clear focus on financial institution end-users.

The fast-evolving capabilities and the challenges attached to the development of business opportunities should favor a transformation of the ecosystem. While government and private end-users will be eager to leverage new capabilities, strategic partnerships and/or different forms of consolidation and vertical integration should contribute to reshaping the industry in the next three to five years.

ABOUT SATELLITE-BASED EARTH OBSERVATION

ABOUT

Now in its 11th edition, *Satellite-Based Earth Observation, Market Prospects to 2027* provides an assessment of the current EO value chain, along with forecasts as to how this may evolve leading to 2027. Each aspect of the value chain is taken in turn from government and private investment down to value-added services, providing a full 360° view of the opportunities and issues related to the EO sector and how these trends will progress over the coming 10 years.

ELEMENTS OF THE REPORT INCLUDE:

- ✓ PDF & Excel & files
- ✓ Thousands of data points

NEW IN THIS EDITION:

- ✓ Updated model for the assessment of baseline & upside market potential for value-added services

KEY TRENDS, DRIVERS & FORECASTS

- Current & forecast market situation to 2027, full assessment of challenges, risks & growth drivers
- Assessment of commercial opportunities including data and services demand by data typology & sector
- Assessment of commercial opportunities by satellite manufacturer
- Detailed assessment of pricing trends
- Impacts of small satellite solutions along the value-chain

DETAILED VALUE-CHAIN ANALYSIS

- Assessment of opportunities & challenges across the industry
- Upstream & downstream analysis, including: Launch, manufacturers, operators & services
- Analysis of the EO supply chain, distribution & mechanisms to reach end-users
- Analysis of government investment, operators, distributors & service providers

DATA & SERVICES DEMAND

- Broad analysis of data demand & requirements – drivers & risks for growth
- Market forecast for EO value-added services
- Opportunities for data & services growth across regions
- Developments & markets for UAVs

SATELLITES LAUNCHED & FORECAST

- Launches from 2008-2017; Expected launches through 2027
- Satellite imaging characteristics, operator typology, etc.
- Prime manufacturer/launch service provider/uncontracted satellite missions
- Detailed breakdown of application sectors within each region
- Consolidated forecasts per application sector & per region

TABLE OF CONTENTS

01\ STRATEGIC ISSUES AND FORECASTS

- Value-chain summary: Investment and upstream
- Value-chain summary: Operations and downstream
- Earth observation satellite launch status: The last 10 years
- Earth observation satellite launch status: The future decade
- Smallsats and the newspace environment
- Commercial optical solutions collection capacity
- Commercial data demand: The changing dynamic
- Limitation on the approach
- Commercial data & services demand: Summary & logic
- The commercial data market: Current situation
- Commercial data demand: Forecast
- Value-added services (baseline) market
- Value-added services (upside) market

POLICY AND REGULATION

- Overview
- U.S. focus
- Further supporting policies
- Summary of national frameworks

02\ KEY DRIVERS FOR DATA AND INFORMATION SERVICES

- Structure of information service: From Pixel to product

COMMERCIAL DATA PRICING

- Current pricing
- Catalog standard tasking price evolution
- Importance of geolocation accuracy on pricing
- Free and low-cost solutions
- Evolution of free data consumption

VALUE-ADDED SERVICES

- Service evolution
- Drivers and risks by positioning
- Drivers and risks by vertical market
- Big data and AI business impact: AI-The promise for big data usage
- Big data and AI business impact: Overview of the AI value chain
- Big data and AI business impact: Selected trends for AI companies
- Data to analytics
- New services impact: How to define cost and value

03\ PROFILES OF SELECTED ORGANIZATIONS

- Highlights of the previous year in commercial supply
- Integrated commercial offerings
- Earth observation commercial focus
 - MAXAR
 - Airbus
 - UrtheCast (inc. Deimos)
 - Planet (inc. BlackBridge & Terra Bella)
 - ImageSat
 - BlackSky Global
 - DMC International Imaging (DMCII)
 - e-Geos
 - ICEYE
 - Capella Space
 - Satellogic
 - Hera, XpressSAR, Astro Digital,
 - Earth-i, EarthNow

COMMERCIAL POTENTIAL OF NEW SENSOR TYPOLOGIES

- Exploring further commercial potential with new sensors
 - GPS-RO
 - Localized environment monitoring
 - Hyperspectral
 - Branching out in SAR

04\ PROSPECTS FOR THE DEVELOPMENT OF NEW SYSTEMS

MANUFACTURING AND LAUNCH OF SATELLITES

- Overview (non-meteorology)
- Earth observation (non-meteorology)
- Focus on export opportunities
- Meteorology
- Developing capabilities in smallsats
 - SAR focus
 - Optical focus

LAUNCH SERVICES MARKET

- By region
- Launch service providers
- Access to space
- Upcoming launch vehicles
- Launch brokers
- Price points for launch

GROUND SEGMENT IMPLICATIONS

- Ground antennas
- Reducing latency and increasing data rates
- Operations

UAV CAPABILITIES: ROADMAP & MARKET

- Market overview
- UAS business model
- UAS company profiles
- UAS Applications
- Policies and regulations
- Examples of commercial and civil government contracts
- Roadmap of UAS capabilities: Typology
- Roadmap of UAS capabilities: High-altitude platforms
- High-altitude platforms' added value
- High-altitude platforms' programs

05\ GOVERNMENT PROGRAM DEVELOPMENT

- Earth observation government programs' focus
- Focuses on emerging Earth observation programs
- Earth observation government focus
- Governments as information buyers and users
- Government supply solutions

EARTH OBSERVATION PROGRAMS (>\$100 MILLION ANNUALLY)

- United States
- China
- European Union
- European Space Agency (ESA)
- France
- Japan
- India
- Russia
- South Korea
- Canada

EARTH OBSERVATION PROGRAMS (<\$100 MILLION ANNUALLY)

- Europe (Exc. ESA)
- Latin America
- Middle East and CIS
- East Asia
- Africa

METEOROLOGY PROGRAMS

- NOAA
- EUMETSAT
- Other programs

06\ DEMAND FOR EARTH OBSERVATION: BY SECTOR

- Data requirements by sector
- Sector demand overview: Commercial data
- Sector demand overview: Value-added services
- Sector demand overview: General overview
- Data requirements by key applications

SECTOR DEMAND

- Defense
- Infrastructure
- Environment monitoring
- Natural resources monitoring
- Energy
- Location-based services
- Disaster management
- Maritime
- Finance

07\ DEMAND FOR EARTH OBSERVATION: BY REGION

REGION DEMAND OVERVIEW

- Commercial data demand by region
- Value-added services demand

REGIONAL DEMAND SNAPSHOT

- North America
- Europe
- Rest of Asia
- Latin America
- Middle East
- South East Asia & Oceania
- Africa
- Russia & CIS

DEMAND FOR EARTH OBSERVATION SOLUTIONS REGIONAL DEMAND SNAPSHOT: AFRICA

COMMERCIAL MARKET 2012-2027

AFRICAN MARKETS REMAIN IN THE TAKE-UP PHASE: Few countries operate EO satellites, and the wider topic of geospatial technologies remains somewhat nascent. Supporting IT infrastructure can also be problematic. However, countries such as Nigeria, Algeria and South Africa have built satellite capacity, and user communities are growing. Countries such as Morocco and Ghana have also recently established remote-sensing agencies, and

KEY DRIVERS FOR DATA DISTRIBUTION AND INFORMATION SERVICES
BIG DATA AND AI BUSINESS IMPACT: OVERVIEW OF THE AI VALUE CHAIN

AI is characterized by a mixture of commercial and open-source solutions. At the top, there is server infrastructure to support cloud computing and the data input (from satellite, multiple sources etc.), then by developing algorithms, information can be extracted and delivered as a service.

- **Cloud computing** solutions are mainly held by large Internet companies that store vast quantities of data (Google, Amazon, Microsoft, Facebook and Apple). The investment to support such hardware being significant. Only commercial technologies are available that are mature. Access to these solutions are made on commercial basis with most EO operators expected to take advantage of these solutions.
- **Data acquisition** incorporates EO data with other sources of information. This can include low-data-rate technology (such as AIS and IoT), in-situ data collection, plus statistical information, such as market trend analytics. This is computed with the satellite imagery to build multisourced solutions.
- **Data tools** to support analysis are mainly open sourced. They are designed to give maximum development potential. They are developed by leading technology companies, such as Google's TensorFlow and Microsoft's CNTK. These software libraries allow to train computers by adapting mathematical operations for a dedicated purpose, such as recognizing objects in an image and self-organizing the computation.
- **Services** are proposed by multiple typologies of companies from start-ups, government departments and established industries. Their objectives are to delivers insights reports from images to the end user and to develop new applications.

KEY METRICS* Taking the base

	Share of Total EO	2017	2027
DATA	3%	\$47 Mn	\$118
VAS	3%	\$109 Mn	\$205
TOTAL	3%	\$156 Mn	\$324

DECADAL ABSOLUTE GR

SATELLITE-BASED EARTH OBSERVATION
© Euroconsult 2018 - Unauthorized reproduction is a copyright violation

COMMERCIAL

OPEN SOURCE

INPUTS - SUPPORT

- CLOUD COMPUTING** - Server infrastructure (OneDrive, Facebook, AWS, Twitter, Google, Apple, etc.)
- DATA ACQUISITION** - Remote sensing, IoT (DigitalGlobe, Planet, Airbus, etc.)

OUTPUTS - SUPPORT

- TOOLS** - Development algorithm (MATLAB, neural designer, theano, TensorFlow, etc.)
- SERVICES** - Extraction, Transformation (Airbus, DigitalGlobe, DARPA, Stanford University, etc.)

SATELLITE-BASED EARTH OBSERVATION - MARKET PROSPECTS TO 2027
© Euroconsult 2018 - Unauthorized reproduction is a copyright violation



ORDER FORM

(1/2) (COPYRIGHT ON REVERSE SIDE IS MANDATORY)

SATELLITE-BASED EARTH OBSERVATION: MARKET PROSPECTS TO 2027 2018 Edition

Please complete this form and return by e-mail to reports@euroconsult-ec.com **or** by fax to + 33 1 48 05 54 39. If you have any questions about ordering, would like to enquire about specific corporate licenses or would like to order for multiple locations and/or legal entities, please contact reports@euroconsult-ec.com or call +1 (514) 303-0304. **All prices are in Euros. All orders must be prepaid** (if not possible, please contact us). Applicable VAT taxes will be added in Euros.

1

Product		Price	Total
eFiles (PDF & Excel files)		€ 6,000	
Additional eFiles license	Qty:	€ 600	
Enterprise license		€ 15,000	
VAT if applicable companies based in France must add VAT 20%			
Product Total in Euros (€)			

3

Accounting Dept. E-mail: _____

4

Invoicing Address (Please use capital letters)

First name _____

Last name _____

Company name _____

Occupation _____

Address _____

Zip Code _____ City _____

State _____ Country _____

Phone _____ Fax _____

E-mail _____

5

Delivery Address (If different from invoicing address)

First name _____

Last name _____

Company name _____

Occupation _____

Address _____

Zip Code _____ City _____

State _____ Country _____

Phone _____ Fax _____

E-mail _____

2

Payment Information

Company VAT n° (required for all companies)

Credit Card

Please check credit limit with bank prior to submitting form.

VISA

Mastercard

AMEX

Cardholder Name (as it appears on card)

Cardholder Number
_____|_____

Expiration Date (month/year) | Cryptogram (last 3 digits on the back)
_____|_____

Cardholder's Signature

Bank Transfer

(All bank charges are to be paid by the sender)

to EUROCONSULT, please NOTE IMPERATIVELY:

Swift-BIC code: CM CI FR PP

IBAN: FR76 3006 6109 1500 0200 6760 132

Account n° 00020067601

CIC Nanterre Enterprises, 105 Rue des 3 Fontanot, 92022 Nanterre Cedex, France.

Cheque or Money Order Enclosed

Payable to Euroconsult:

86 Blvd. Sebastopol, 75003 Paris, France



COPYRIGHT AGREEMENT

(2/2) (COPYRIGHT ON REVERSE SIDE IS MANDATORY)

SATELLITE-BASED EARTH OBSERVATION: MARKET PROSPECTS TO 2027 2018 Edition

Please complete and return the order form & copyright agreement by e-mail to reports@euroconsult-ec.com or fax to + 33 1 48 05 54 39. Each team user must sign a copy of the copyright agreement. Please complete the information below for each user of the research files.

Please read this license agreement carefully.
By using the research files, you are agreeing
to adhere by the terms of this license.

SINGLE USER LICENSE

- a) This product is licensed only for a team working together on a project, working on the same site in the same company. The person signing this agreement is responsible for the use of the research files. Euroconsult must be informed of all users of the research files before use. The information may not be shared with other company sites or other work teams in the same or other companies in any form, neither photocopied nor reproduced, including for internal use.
- b) No part or extract, in any format whatsoever, must be transmitted to any other organization, including cooperative entities and subsidiaries. All licenses purchased at the additional license price are for internal use only by the organization ordering (same company name, same location as indicated on original order form). Euroconsult must be informed of the users of the additional licenses purchased.
- c) All data or information extracted from the research files for use in other documents must rightfully use the copyright reference: *Euroconsult, name of report, year*. Before any other use of the information contained in the research files, prior written consent by Euroconsult is required.
- d) This Agreement shall in all respects be governed by the laws of the Republic of France. The user agrees that the proper jurisdiction and forum for the resolution of any claim arising under this license shall be at Euroconsult's sole option.

Research Report User

First name

Last name

Company

Occupation

E-mail

Date

SIGNATURE:

Research Report User (For additional user)

First name

Last name

Company

Occupation

E-mail

Date

SIGNATURE:
