TRENDS & PROSPECTS FOR EMERGING SPACE PROGRAMS

2016 Edition | A Euroconsult Executive Report

An in-depth analysis of the key drivers, activities and challenges for emerging space programs.

- ✓ **Over 50 pages, including numerous graphs & tables**
- ✓ **Thousands of data points**
- ✓ **Price starting at € 4,000**

24 countries are identified as emerging space programs (ESPs) in 2015 having launched a total of 69 satellites in the last 20 years. As satellite technology has become more accessible and affordable, the number of countries investing in their first satellite system has increased dramatically. 2015 set an all-time record with nine satellites launched, confirming the dynamism of this market.

By 2025, it is estimated that the number of emerging space programs will increase to 47 countries around the world. This includes 23 newcomers who will have committed their first investment in space between 2016 and 2025. 131 satellites are forecasted to be launched in the next 10 years, nearly double that of the last decade. The total value of these satellites is estimated at nearly $12 billion, versus more than $5 billion during 2006-2015.

New to this edition, Euroconsult has developed an index which aims to model the probability for a new country to invest in a satellite system. The ESP Index is based on a three part process consisting of data gathering, analysis, and ranking of 148 countries. The index is based on factors deemed to be relevant to evaluating the start of a space program. The relevance of the ESP Index was verified with a "reality check" by reviewing the score of countries that have already launched or ordered a satellite.

Based on their score in Euroconsult's ESP index, some countries show a high profile regarding potential investment in satellite solutions and acquisition; four countries show very high potential as they rank in the top 20 countries of the ESP Index while not having yet procured a satellite. Five other countries rank between 20th and 30th position.

Another innovative feature of the report is a targeted survey completed with a selection of countries, part of the 24 countries identified as "already active" ESPs. The questionnaire was aimed to collect primary information on the countries' experience in implementing a satellite program, their strategy, benefits and lessons learned. The survey results, along with the collection of public information and our own expert knowledge, are combined to establish Euroconsult's benchmark of emerging space programs.

ABOUT EMERGING SPACE PROGRAMS

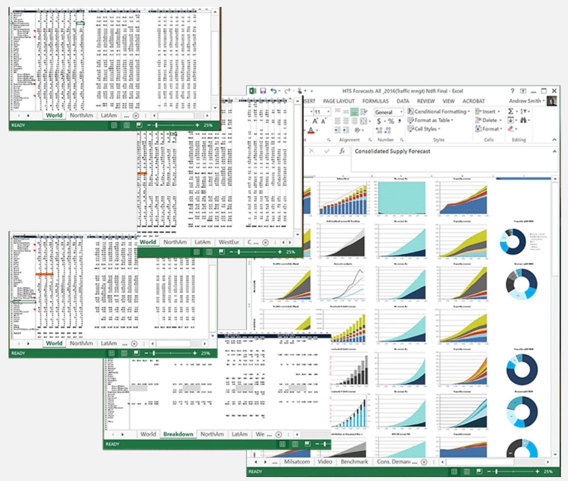
Trends & Prospects for Emerging Space Programs analyzes the development of Emerging Space Programs (ESPs) around the world. The report identifies existing and potential new entrants in space, analyzes global trends related to ESPs, benchmarks their strategies of investment, and analyzes the various issues faced by these new players and their partners/suppliers for the implementation of their programs.

EXTENSIVE FIGURES & ANALYSIS FOR THE COMING DECADE

All Euroconsult reports have, at their core, data derived from over 30 years of tracking all levels of the satellite/space value chain. To this we add dozens of dedicated industry interviews each year, along with the continual refinement of our data models, and the collection and interpretation of company press releases and financial filings. Our consultants have decades of experience interpreting and analyzing our proprietary databases in light of the broader value chain.

When you purchase research from Euroconsult, you receive thousands of data points and the expert interpretation of what this means for specific verticals and sectors of the satellite value chain, including forecasts based on years of data and highly refined models.

This report contains thousands of data points.



METHODOLOGY:

Countries considered as ESPs include all countries having launched their first satellite (>50 kg) after 1996, i.e. within the last two decades. Countries having launched satellites before that year are therefore not considered as ESPs and are not in the scope of this report.

Analysis, data and estimates rely on two complementary approaches:

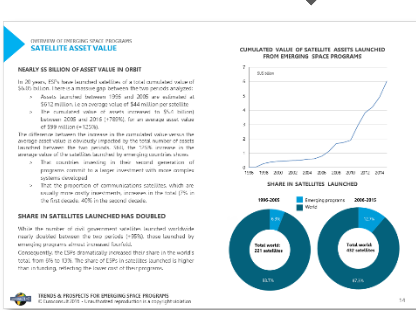
- ✓ In-depth research and data collection on all countries in the scope of the study including official reports, press releases, news articles and industry white papers. Further, we relied on our continuous research on the satellite sector and government programs.
- ✓ Survey of a selection of countries on the basis of a questionnaire with detailed information collected on their programs, strategy pursued and lessons learned.

Finally, we developed a dedicated index covering 148 countries to measure the likelihood for a new country to invest in a satellite system. The ESP Index models multiple metrics and can be used as a tool to monitor opportunities worldwide.

REPORT STRUCTURE

REFERENCE INDICATORS

ANALYSIS



WHO WILL BENEFIT FROM THIS REPORT:

- ✓ Space agencies & other government agencies
- ✓ Satellite & launch vehicle manufacturers
- ✓ Equipment providers

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BENCHMARK OF EMERGING SPACE PROGRAMS

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REGIONAL FOCUS

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Each regional overview includes:

THE ESP INDEX

INTRODUCTION

Euroconsult has developed an index which aims at modelling the probability for a new country to invest in a satellite system. The ESP Index is based on a three-part process consisting of data gathering, analysis, and ranking of 148 countries. Countries with a space program already in place before 1996 were excluded from the analysis, as well as those for which insufficient data was available to arrive at an accurate overall evaluation (essentially very small / insular countries).

The index is based on factors deemed to be relevant to evaluating the start of a space program. Factors were equalized and weighted based on their level of "desirability," which are (by order of importance).

- **GDP:** Higher GDP implies greater investment capability in a space program
- **Natural resources on GDP:** Satellite technology is more attractive for countries with a national economy depending on natural resources
- **Neighbor Effect:** The fact that a neighboring country has launched satellites is an incentive to develop satellite capacity
- **Population:** Countries with large populations are more inclined to exercise leadership in their region
- **GDP per capita:** Countries with high GDP per capita are more inclined to invest in technology sectors
- **Population density:** Satellite technology is considered more attractive in terms of infrastructure costs for areas with lower population density.

FACTORS CONSIDERED IN THE ESP INDEX*

FACTOR	DEFINITION	SOURCE
GDP (Total)	GDP at purchaser's prices is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products.	World Bank
TOTAL NAT.RESOURCES (% GDP)	Total natural resources rents are the sum of oil rents, natural gas rents, coal rents, mineral rents, and forest rents.	World Bank
NEIGHBOUR EFFECT	National pride and the "neighborhood" effect are further incentives to develop satellites capacity.	Euroconsult
POPULATION	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or Considering midyear estimates.	World Bank
GDP/CAPITA	GDP per capita is gross domestic product divided by midyear population.	World Bank
POPULATION DENSITY	Population density is midyear population divided by land area in square kilometers.	World Bank

* Considering 2014 estimates except when stated otherwise

THE SURVEY

INTRODUCTION – APPROACH FOLLOWED

In order to benchmark emerging space programs, an innovative approach was followed mixing the collection of public information, expert knowledge and primary information collected via a dedicated survey.

Considering the type of the information targeted for this report, a specific interview process was designed, similarly to those performed for a consulting mission. The objective was to undertake a targeted survey with a limited number of countries.

A selection of countries accepted to participate in the survey. All of them have already launched a satellite and are part of the 24 countries identified as "already active" ESPs.

In agreement with them, their identity has not been disclosed in order to protect the confidentiality of the information.

THE QUESTIONNAIRE

The questionnaire was distributed into three parts. Questions involved a mix of answer type - multiple choice or open, qualitative and quantitative, ranking and scoring, etc.

PART 1: EXPERIENCE IN IMPLEMENTING A SATELLITE PROGRAM

- How many satellites
    - Have you launched?
    - Do you operate today?
    - Do you intend to operate by 2025?
- Information on missions launched
- Information on mission
- What is your current annual budget? Do you expect it to grow, decrease or remain stable in the coming years?
- From your experience, could you breakdown the typical investment in a satellite program?

PART 2: STRATEGY AND MODELS PURSUED

- In which year was your organization/agency created?
- What is the overall mandate given to your organization/agency?
- What is the rationale for your government to invest in space?
- Could you rank the interest of your country between applications? What has been the model pursued to finance your space program so far?
- How have you pursued the following activities so far (manufacturing, operations, services)?

PART 3: BENEFITS AND LESSONS LEARNED

- Who are the primary users of your satellite system(s)?
- What are your main requirements related to the procurement of your satellites?
- What is your level of satisfaction regarding these domains?
- In general, what have been the biggest challenges you've met when implementing your program(s)?

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