



INTERNATIONAL FUTURES PROGRAMME

OECD Global Forum on Space Economy

# **THE SPACE ECONOMY: Measurement Challenges for a Growing Sector**

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Key message:

The space sector is an increasingly important activity both as a generator of leading-edge technologies and as supporting infrastructure for many key economic, social, technological and environmental activities. However, its scale and its impacts on economy and society are extremely difficult to measure because of a chronic lack of sound official statistics.

After World War 2, space technologies were mostly developed in view of exploration or in pursuit of military goals. After sixty years of international competition, R&D progress and spin offs, civil and commercial space based applications are receiving a lot of attention from policy makers as well as decision makers in the public and private sectors. Space based applications are in fact contributing to many of the important social and environmental challenges to be addressed during the 21<sup>st</sup> Century. The sector of civil applications, including telecommunication, navigation and earth observation tools is worth around 100-200 bn US \$ a year in sales revenues on a global basis. It is likely that this figure is considerably underestimated since a number of non OECD countries have recently emerged on the scene as important players, and the downstream segment is not well circumscribed. Existing national statistics are not really tailored to accurately measure what OECD now refers to as the space economy.

Measurement challenges in the case of the space economy are quite similar to the ones that had to be solved regarding information and communication technologies 10-12 years ago, and to the ones that are also currently addressed to cope with the concept of bioeconomy and tomorrow perhaps to better highlight the future of nanotechnologies. It is not surprising therefore that OECD and other governments are looking at these new sectors to better understand which will drive economic growth, particularly since ICT, bioeconomy and the space economy are also integral parts of the knowledge economy.

The OECD Global Forum on Space Economy, launched for three years in 2006 as a Futures Project, and made up of representatives of OECD space agencies, governmental agencies, and ministries, is urging the statistics community to take into account the need for more evidence based statistics covering the space economy. The issues involved include revisions of the ISIC classification, improved breakdowns in R&D expenditures, trade statistics, employment and better coverage of services and the downstream segment. Such matters increasingly require the attention of NSOs, Policy makers and business executives alike wish to be in a much better position to assess the potential economic and social impacts of the space economy, when taking major policy or private investment decisions.

Background:

Space technologies have started permeating many aspects of life in our modern societies, bringing about substantial improvements in communications, transport, media delivery, and environment. The ability to forecast better the weather has many applications in industry, leisure activities, and in the management of natural disasters. With the increasing attention paid to the developments in space activities, the need has grown for statistics and analysis in this area to better support and inform policy making.

In 2002, in collaboration with the space community, the OECD International Futures Programme (IFP) launched a project to explore how space technologies could potentially contribute in finding solutions to some major enduring societal problems. The IFP is a forward-looking multidisciplinary group with the mission to alert the Secretary-General and the Organisation to emerging issues by pinpointing major developments and analysing long-term concerns with a view to helping governments map their strategy. Two publications came out of this first extensive and intensive OECD look at the space sector. The first one *Space 2030: The Future of Space Applications* (2004) explored promising space applications for the XXIst century. The second one, *Space 2030: Tackling social challenges* (2005) assessed the strengths and weaknesses of the regulatory frameworks that govern space and formulated a policy framework that OECD governments might use in drafting policies to ensure the full potential that space offers is realised.

Following the project, there was strong encouragement for OECD to continue to be involved. A number of institutions, especially space agencies, asked the IFP to continue exploring the economic dimensions of space infrastructure. In that context, an innovative platform for international dialogue on the social and economic aspects of space activities was launched in February 2006: the OECD Global Forum on Space Economics. This Forum is supported by voluntary contributions from a number of governments and space agencies (ASI, BNSC, CNES, CSA, ESA, NOAA, Norwegian Space Centre, USGS). It aims to provide evidence-based analysis to assist agencies and governments in shaping policy.

*The Space Economy at a Glance*, a forthcoming OECD Publication, will be an innovative compilation of statistics on the space sector and its contributions to economic activity. In addition, it will offer critical insights into some of the main problems involved in deriving internationally comparable data for the industry and its downstream activities, notably the lack of detailed data, and conceptual and definitional problems.

The impetus for this publication was provided by a 2003 paper prepared by Dirk Pilat and Sandrine Kergroach-Connan, then at the OECD Economic Analysis and Statistics (EAS) Division of the Directorate for Science, Technology and Industry (DSTI). The first version served as an annex to the OECD publication *Space 2030: Exploring the Future of Space Applications*. The paper has been updated and enriched with new data, graphs, text and overall presentation to become a part of the OECD “at a glance” publications collection. This work would not have been possible without the support of Paul Schreyer and Andreas Lindner from the Statistics Directorate, and Colin Webb, Administrator, in the Science, Technology and Industry (STI) Directorate.

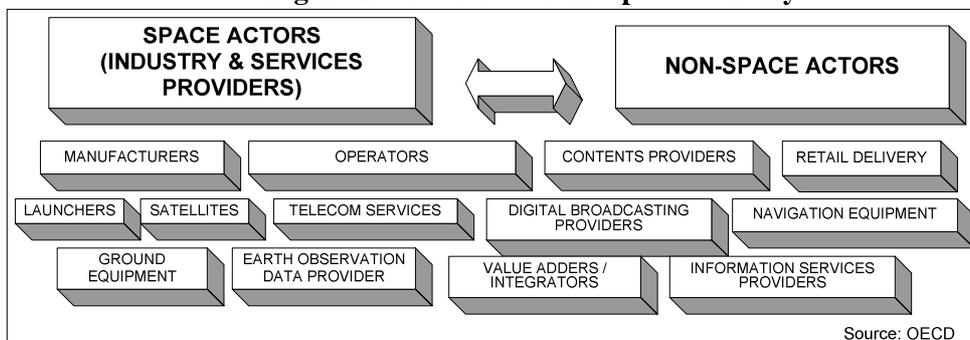
Defining the space economy:

Space technologies have started permeating many aspects of life, for example communications, culture, weather forecasting, and air traffic control. Although an increasing number of countries are developing space systems and applications, there are not yet internationally agreed definitions for statistical terminology on space activities. In broad terms, the space economy embraces:

*All public and private actors involved in providing space-enabled products and services. It comprises a long value-added chain, starting with the manufacturers of space hardware (e.g. launch vehicles, satellites, ground stations) and ending with the providers of space-enabled products (e.g. navigation equipments, satellite phones) and services (e.g. satellite-based meteorological services or direct-to-home video services) to final users.*

Hence, the space economy is now larger than the traditional space sector and involves increasingly new services and product providers (i.e. geographic information systems developers, navigation equipment sellers), which are using space systems capacities to create new products (see Figure below).<sup>1</sup>

**Figure 1 – Overview of the space economy**



Governments play a key role in the space economy as investors, owners, operators, regulators, and customers for much of the space infrastructure. As in the case of other large utilities (i.e. water, energy), governments' involvement is needed to sustain the overall space economy.

Estimates of the space economy vary considerably, due the lack of internationally comparable data. Worldwide institutional budgets (around USD 47 billion in 2005 for OECD countries) and new commercial revenues from space-derived products and services indicate that, despite the cyclical nature of commercial space activities (e.g. regular replacement of telecommunication satellite fleets), the underlying trend in the space economy is one of growth.