The place of Europe in space

KEYNOTE - ROUND TABLE 1
MARCH 21ST – BELGIRATE (I)
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ASD-EUROSPACE
The Space group in ASD
Contents

- Global space facts
- The weight of public procurement
- Understanding the commercial market
- Industrial sectors worldwide
- How much is Europe spending in space?
- How does Europe compare internationally?
- Conclusions and recommendations
Global space facts
The weight of public procurement

PUBLIC (INSTITUTIONAL) MARKETS ARE AT THE CORE OF ALL SPACE ACTIVITY
Public initiative is still responsible for the majority of spacecraft launched worldwide, through direct action (procurement of systems) and indirect means (PPPs, anchor tenancy e.g.)

*Space shuttle orbiter mass not included
Private initiative in space very strongly focused on telecommunications. Only public institutions cover the whole span of space applications. They are also in charge of most activities related to technology development and validation.
Institutional captive markets in space 2006-2010: public customers favour local supply

The majority of space markets are **institutional captive markets**, leaving only limited room to global competition.

Horizontal axis: customer country (demand origin)

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The open institutional market (2007-2011)

A very small market...

...where Europe leads

Open vs captive institutional market

Institutional open market
Institutional captive market

Suppliers market shares on the open institutional market

China; 2
USA; 8
Europe; 18
Ex-URSS; 1

GEO
LEO

China
Europe
Ex-URSS
USA

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Spacecraft captive markets compared

- The US industry benefits from the largest captive market of all
- The Russian industry benefits from the next largest captive demand
- The Chinese industry captive demand is comparable to the European one (in size)
- The Japanese captive market is smaller than the European
The commercial market

THE COMMERCIAL MARKET IS NOT THE EXACT COMPLEMENT OF THE INSTITUTIONAL MARKET.
IT IS THE MARKET WHERE THE SATELLITE DEMAND IS EXPRESSED BY SATELLITE OPERATORS.
NOT ALL OF THEM ARE COMMERCIAL ENTITIES.

A MARKET DRIVEN BY ALMOST ONE SINGLE APPLICATION:
TELECOMMUNICATIONS
THE MOST SIGNIFICANT USER OF THE GEOSTATIONARY ORBIT
THE SEGMENT BUILDING THE LARGEST SPACECRAFT
Understanding the commercial market: GEO TLC satellites launched by satellite operators

By supplier country

The GEO TLC supply is dominated by US and European companies.

By customer type

After the privatisations of 2000-2001 the share of public procurement has decreased.
The GEO TLC satellite operators market supply
US vs Europe 2001-2010

- GEO TLC Satellites by supplier region – satellite operators only

![Bar chart showing GEO TLC satellite operators by supplier region (Europe and USA) for 2001-2005 and 2006-2010.]
US and Europe: competition on the GEO satellite market

Satellite customer type

Satellite supplier country

Demand by customer/mission type and supplier origin

US & European supply by customer origin

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Main GEO launchers

GEO spacecraft launched by main launcher family

- CZ
- Atlas
- Delta
- Zenit
- Proton
- Proton
- Ariane
Growing competition in the ‘commercial’ GEO launch market

GEO satellites launched for satellite operators

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The ‘commercial’ GEO launch service market 2007-2011

GEO TLC satellites launched by customer region

GEO TLC satellites launched by customer type

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Despite its apparent maturity, the commercial space segment is still very much dependent on public policies and investments.

- Public sector regulates the attribution of orbital positions and frequencies.
- Public sector funds satellite technology development and maturation,
- Public sector retain the complete control and responsibility of launcher development and operations worldwide, with very few exceptions.
Industrial sector worldwide

GREAT DISPARITIES IN SPACE INDUSTRIAL SECTORS WORLDWIDE:

DIFFERENT SIZES
DIFFERENT TECHNOLOGY LEVELS
DIFFERENT MARKET EXPOSURES
The space industry workforce worldwide: 800,000 people

Space industry output (past 5 years)

Employment in the space manufacturing sector worldwide (est.)

- China: 35%
- USA: 25%
- ex-USSR: 29%
- Europe: 4%
- Japan: 1%
- India: 6%

Total launched mass by launcher supplier

- China: 51%
- Europe: 11%
- ex-USSR: 18%
- India: 4%
- Japan: 1%
- USA: 22%

Total launched mass by satellite supplier

- China: 34%
- Europe: 9%
- ex-USSR: 28%
- India: 5%
- Japan: 2%
- USA: 22%
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European industry delivers 10 to 20 spacecraft for launch every year & up to 7 Ariane launchers
Industrial sectors dependence on local/captive customers (% of nb of spacecraft)

Space industry dependence on domestic markets (spacecraft)

- India
- Japan
- China
- Europe
- Ex-USSR
- USA

2001-2005
2006-2010

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How much is Europe spending in space?

*NOT AN EASY QUESTION, AS IT MAY SEEM...*
European civil space budgets 2010

Cumulated total: 8.7 B€
Consolidated total: 5.6 B€

Source: Eurospace analysis of publicly available official information (annual reports and ESTMP mainly)
The European military space budget: 0.5 to 1B€

- Detailed (open) information on the European military space budget is not available.
- There are also assessment difficulties:
  - Some military budgets/programmes are managed by some national civil agencies.
  - With the introduction of PPP/anchor tenancy concepts (e.g., Satcom BW, Paradigm/Skynet), a share of military budgets do not support direct space systems procurement anymore, but rather the provision of services.
- It can be reasonably estimated that the European military space budget (other than that managed by the national civil agencies) is in the order of 0.5B € to 1B€.

- Only 5 European countries have procured military space systems in the past 10 years.
- Military satellites procured in Europe in 2001-2010 by mission and customer country:

<table>
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<th>Mission</th>
<th>France</th>
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<th>Italy</th>
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</table>
The total European space budget

IN 2010 THE TOTAL EUROPEAN SPACE BUDGET WAS IN THE ORDER OF 6.1 TO 6.6 B€
European space industry revenues 2010

All customers (M€)
- Sales to ESA
- Sales to other European institutions (public)
- Sales to European private operators
- Sales to Arianespace
- Other/unknown European customers
- Sales to Public institutions RoW
- Sales Private satellite operators RoW
- Sales of equipment and parts RoW
- Other/unknown RoW customers

From budget to revenues:
- ESA budget: 4 B€
  - Industry revenues: 2.1 Be
- National budget (incl. military): 2.1 to 2.6 B€
  - Industry revenues: 1.1 B€
- Why the gap?
  - Budget under-spending
  - Agencies internal consumptions and management costs
  - Procurement outside the European space industry
    - Buildings, ground equipment...
    - Launch services procurement

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International comparison

HOW DOES EUROPE COMPARE INTERNATIONALLY?
Civil space budgets worldwide (Billion $)

Source: The Space Report 2011

Civil space agency budgets
2010 in B$

Budget per capita
2010 in $

All budget data included in the space report is based on official sources, EXCEPT FOR CHINA
Civil space budgets in % of GDP 2010 (based on national currency information)

*Information on Chinese space budget in Yuan is not available publicly. Ratio to GDP cannot be calculated.
Growth rate of known civil agencies budget (local currency, index 100 in 2001)

- ESA budget (index)
- ISRO budget (index)
- NASA budget (index)
- Roskosmos budget (index)
- JaXa budget (index)

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Roskosmos and NASA are still the most active civil space agencies
- Note: most of their activity in recent years was related to the ISS

They are now challenged by CASC (China)
- Who also pursues military programmes
- And announces the launch of its own space station

ESA is not on the same level playing field of its two main partners/competitors (the USA and Russia)
- Its activity level puts it closer to JaXa and ISRO
With the inclusion of all public entities (e.g. in Europe=ESA+national+Eumetsat), and the elimination of all military spacecraft the situation changes slightly, but Europe is still behind China.
Europe is not a significant military space power, lacking European-wide programmes in the domain and a commonly shared vision of its military space presence.

The USA pursue the most ambitious and complete military space programme worldwide.

Russia also maintains a significant military space activity.

Chinese ambitions in the strategic domain are showing clearly.
Conclusions
Conclusions

- European positions are challenged
  - In civil space
    - ESA is not anymore the undisputed third player in space behind Roskosmos and NASA.
    - The past decade has shown the constant growth with impressive rates of the Roskosmos and ISRO budgets.
    - The evolution of the Chinese budget remains unknown, but the quantitative series of Chinese space activity speak for themselves.
    - European civil space budget evolution is flat
  - In military space
    - Europe is not a military space power, but Russia, the USA and China are...
    - Military space programmes create a technology and capability gap that is very difficult to bridge

- Captive markets are key
  - Institutional captive markets are the main driving force of space systems and technology
    - There is only limited room for global competition in space
  - European domestic institutional markets are quite weak, compared to Russia, the USA and China
  - Government procurement impacts competition
  - Government ownership of major/critical space assets is still a reality worldwide

- Industrial competition is a complex issue
  - Affected by externalities (government and captive markets), government support and investment
  - Competition is growing on ‘commercial’ and open markets, new entrants (China) and rising ambitions