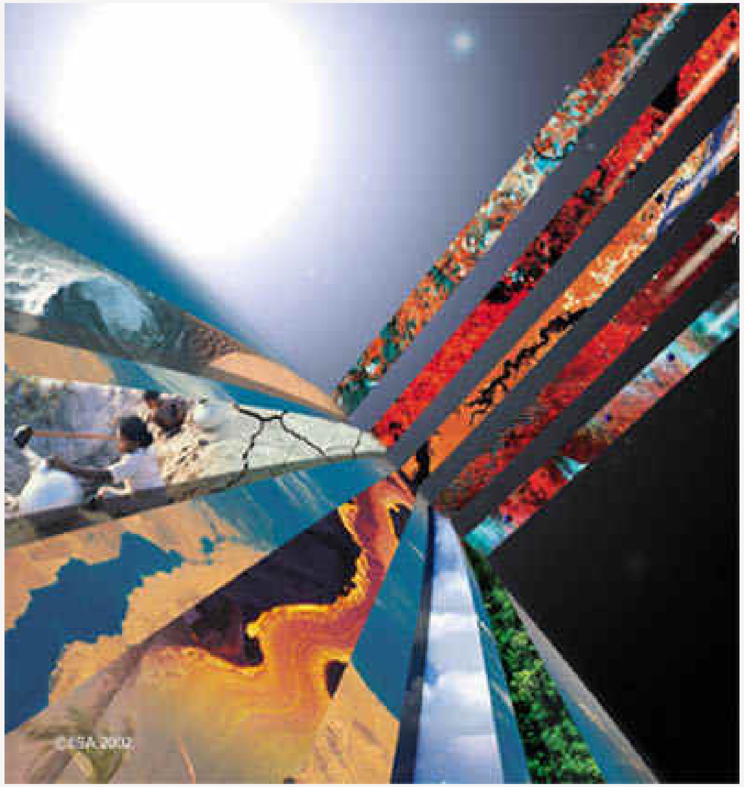
Space Industries of Emerging Space Nations in the Global Market Place



Steve Bochinger,
Director Institutional Affairs,
Euroconsult

United Nations Office for Outer Space Affairs
2008 Industry Symposium "Space Industry in Emerging Space Nations"
Vienna, 12 Feb. 2008

AGENDA

The Space Markets

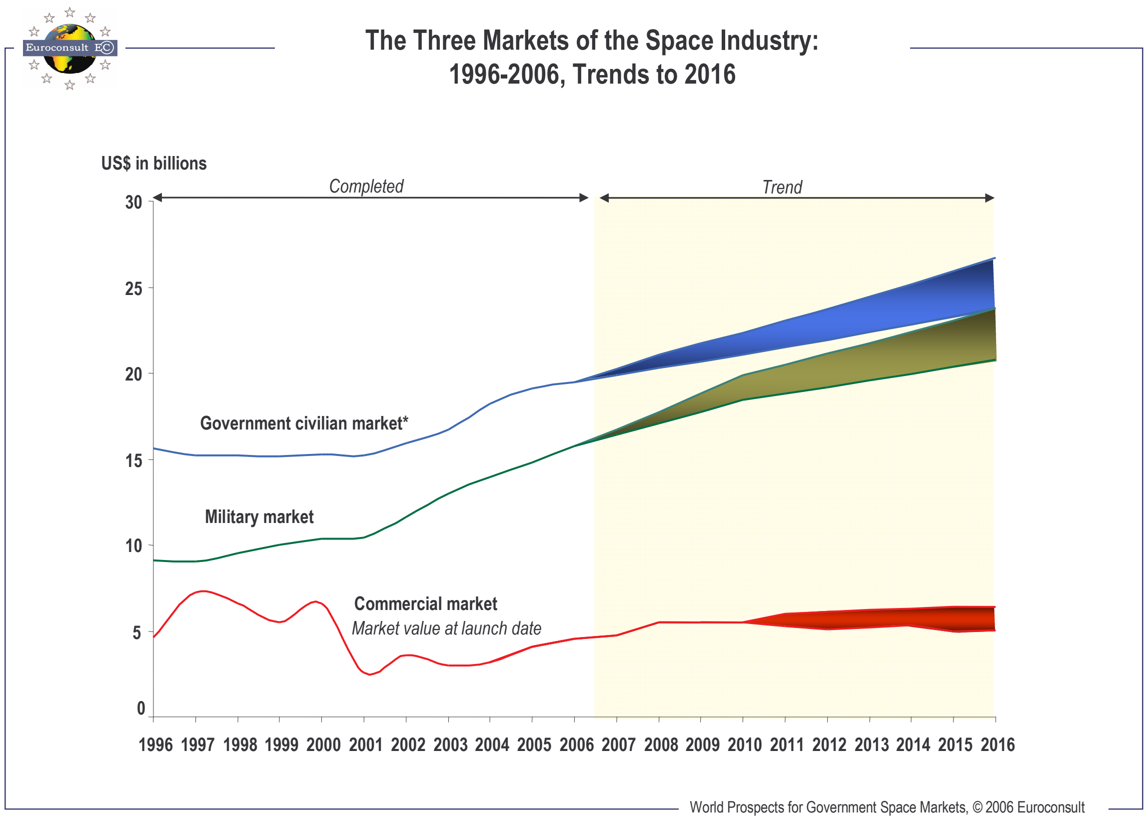
The International Landscape

Motivations to Invest in Space

Conclusions

The Space Markets

Public v. commercial markets



Source: World Prospects for Government Space Markets, © Euroconsult 2006

Government Programs

✓1st source of revenues : budget allocations > $50B in 2007

✓Captive market ensuring a solid recurring basis for national industries

✓Civil market is stable by nature

✓High growth of military expenditures but the market is concentrated, with stronger annual variation

Commercial market

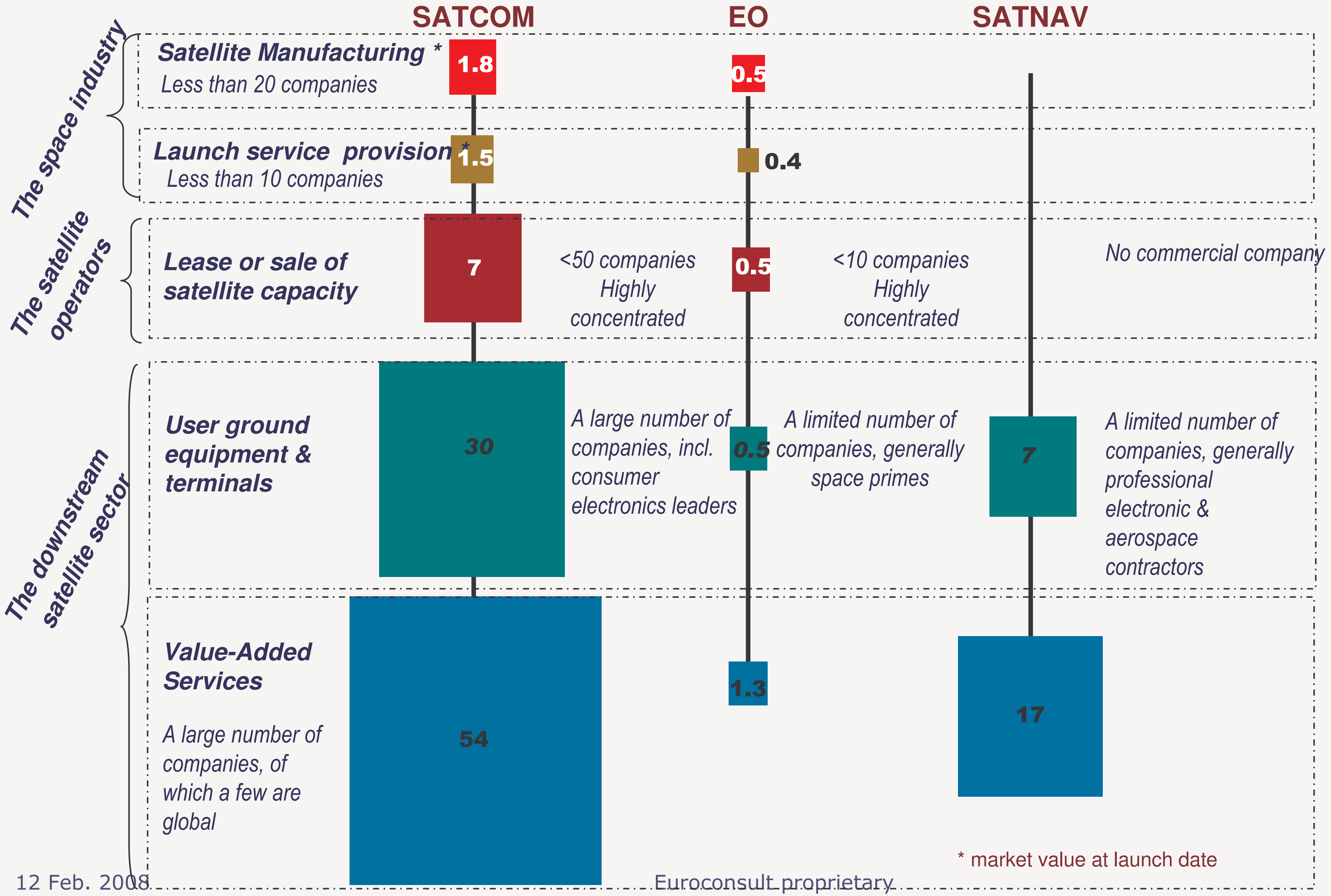
✓Cyclical market / highly competitive

✓Rebound following low market cycle

✓New growth cycle: 20 to 25 Geo sat/Y until 2013

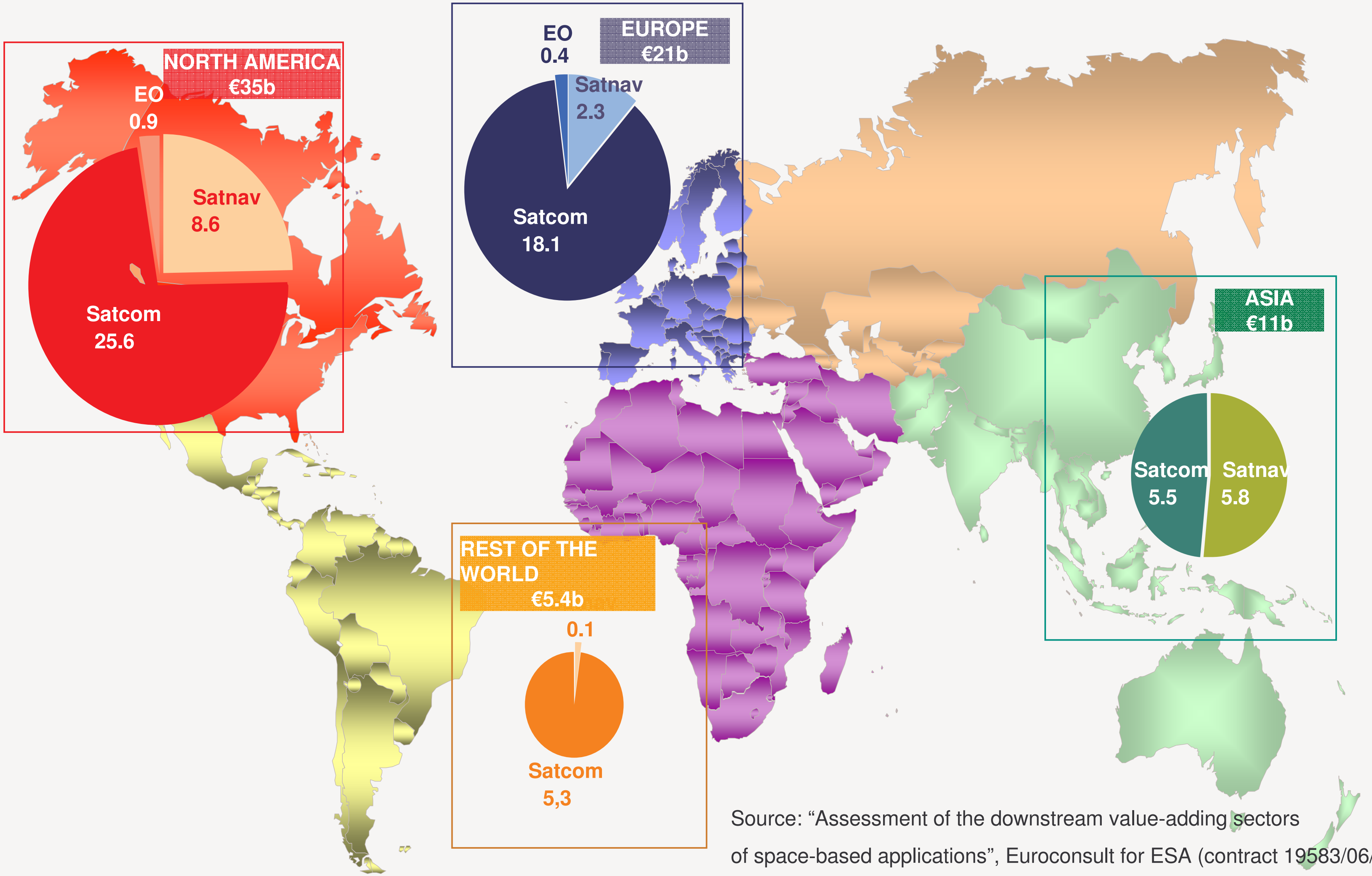
The satellite value chain

Commercial satellite applications in 2005 (€ in billions)



Satellite services

Breakdown of Revenues by Region 2005 - € in billions

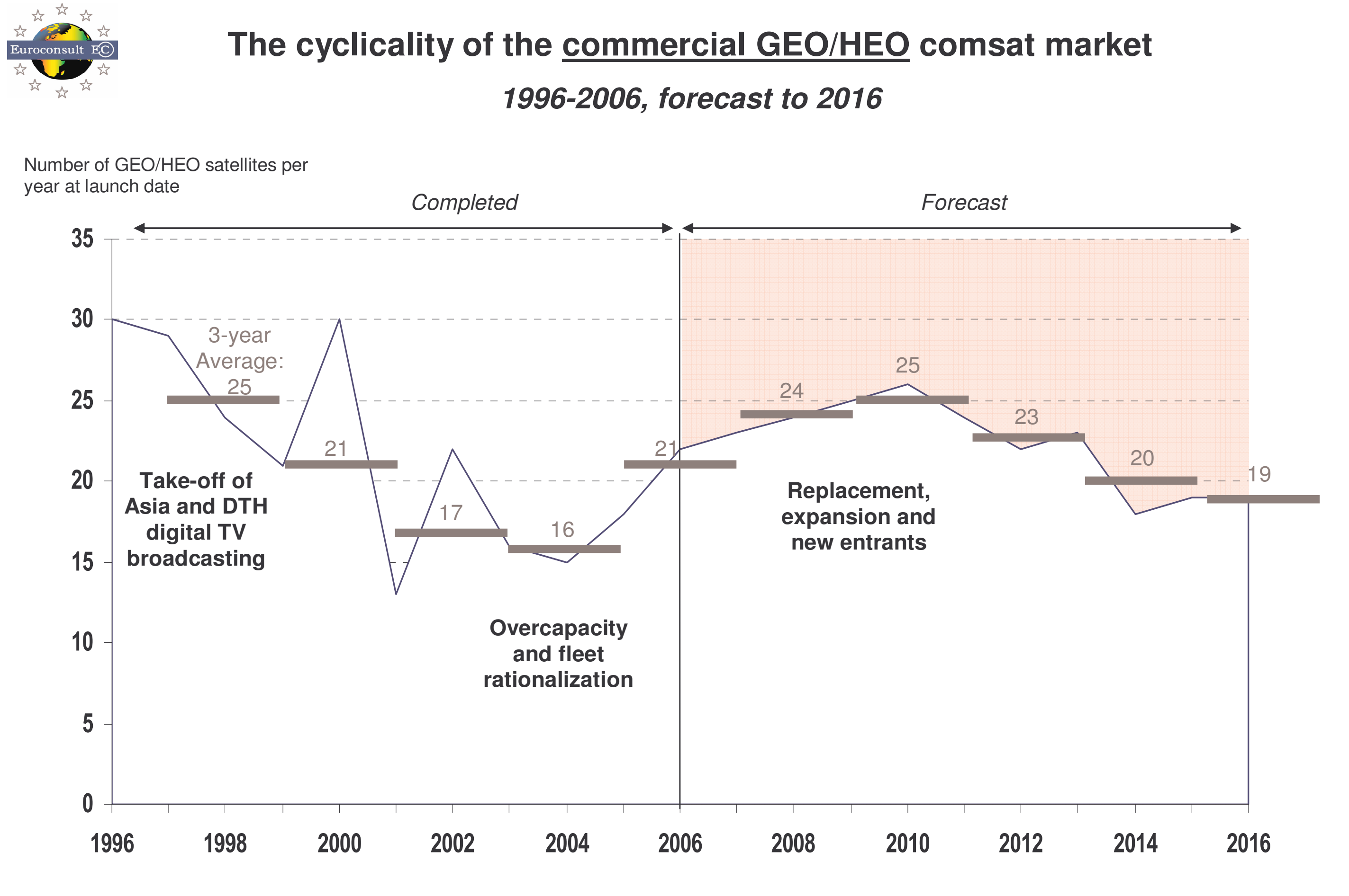


Source: "Assessment of the downstream value-adding sectors of space-based applications", Euroconsult for ESA (contract 19583/06/F/VS)

Earth Observation derived from revenues of US and European/Canadian companies for which geographical split is not available. Europe includes ESA/EU countries (including Canada)

The commercial market

The cyclicality of the commercial market influences the strategy of market players



Satellite manufacturing

Competition, Consolidation…

GEO satellite manufacturing is concentrated within a few capable companies

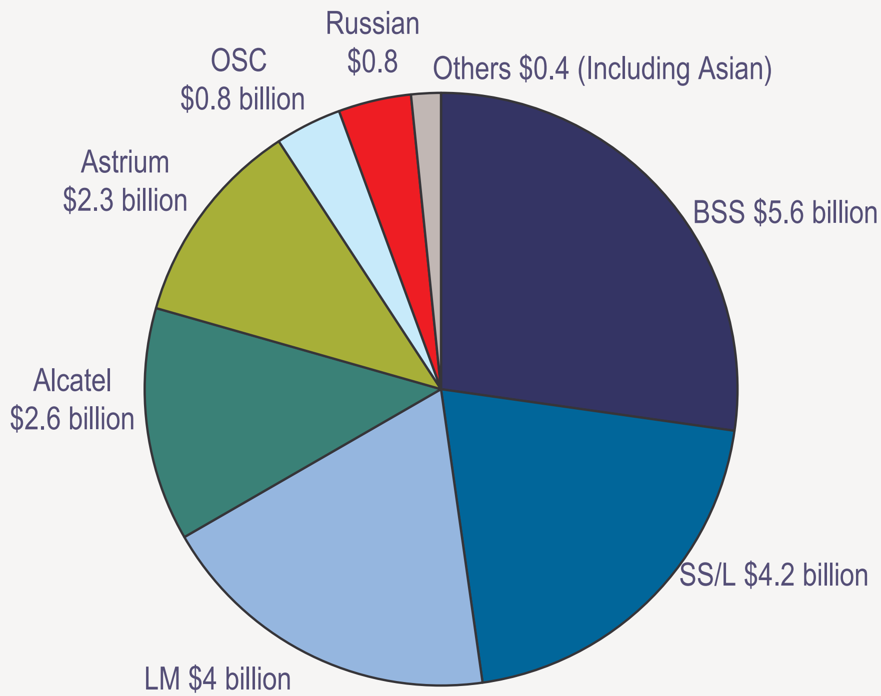
6 Western companies controlled 90% of the commercial GEO satellite market

…and globalization

with the apparition of new industry players

Market shares for GEO/HEO commercial satellite manufacturing

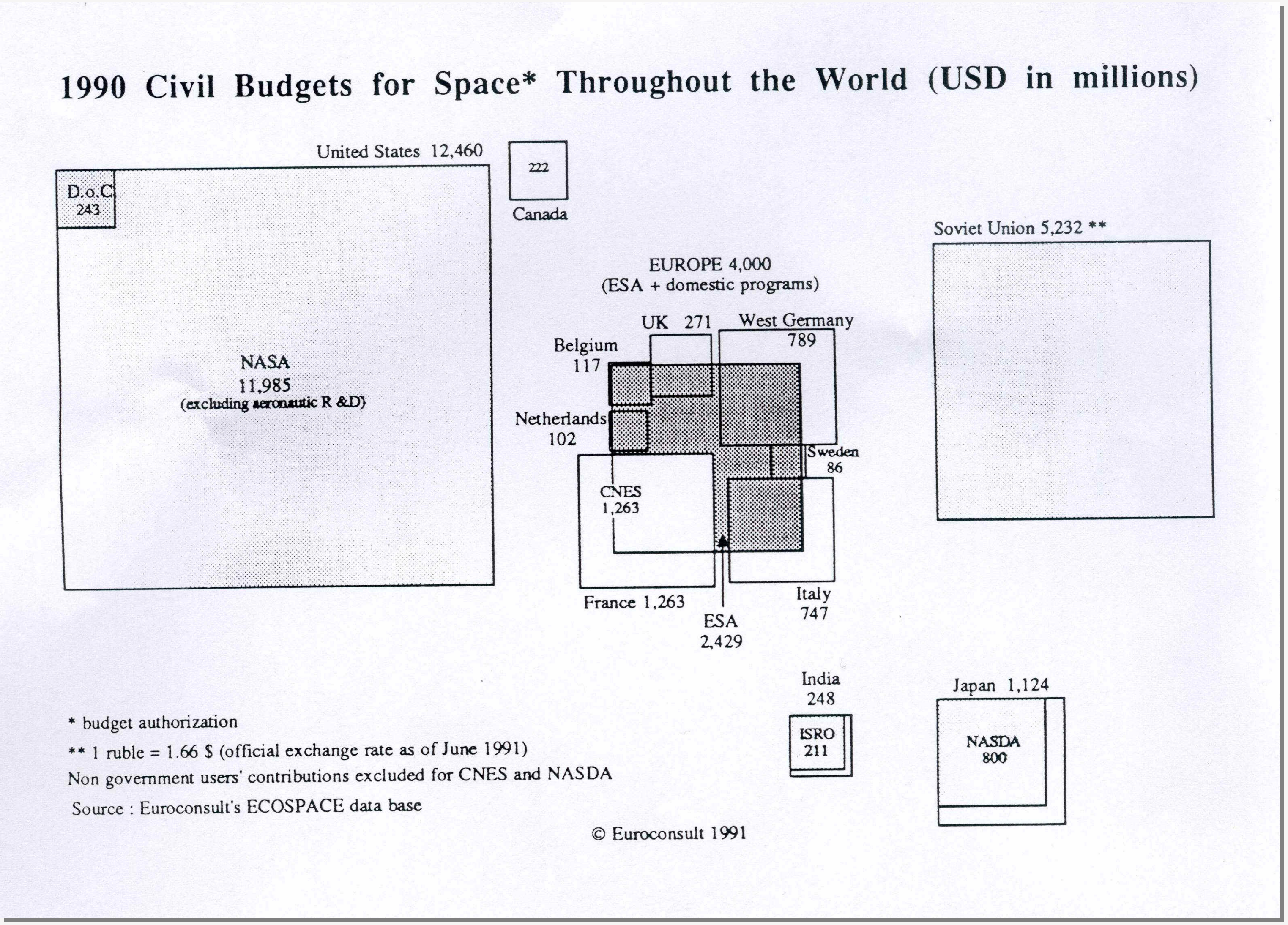
1997-2006 market analysis



Total market $20.7 billion

A new international landscape

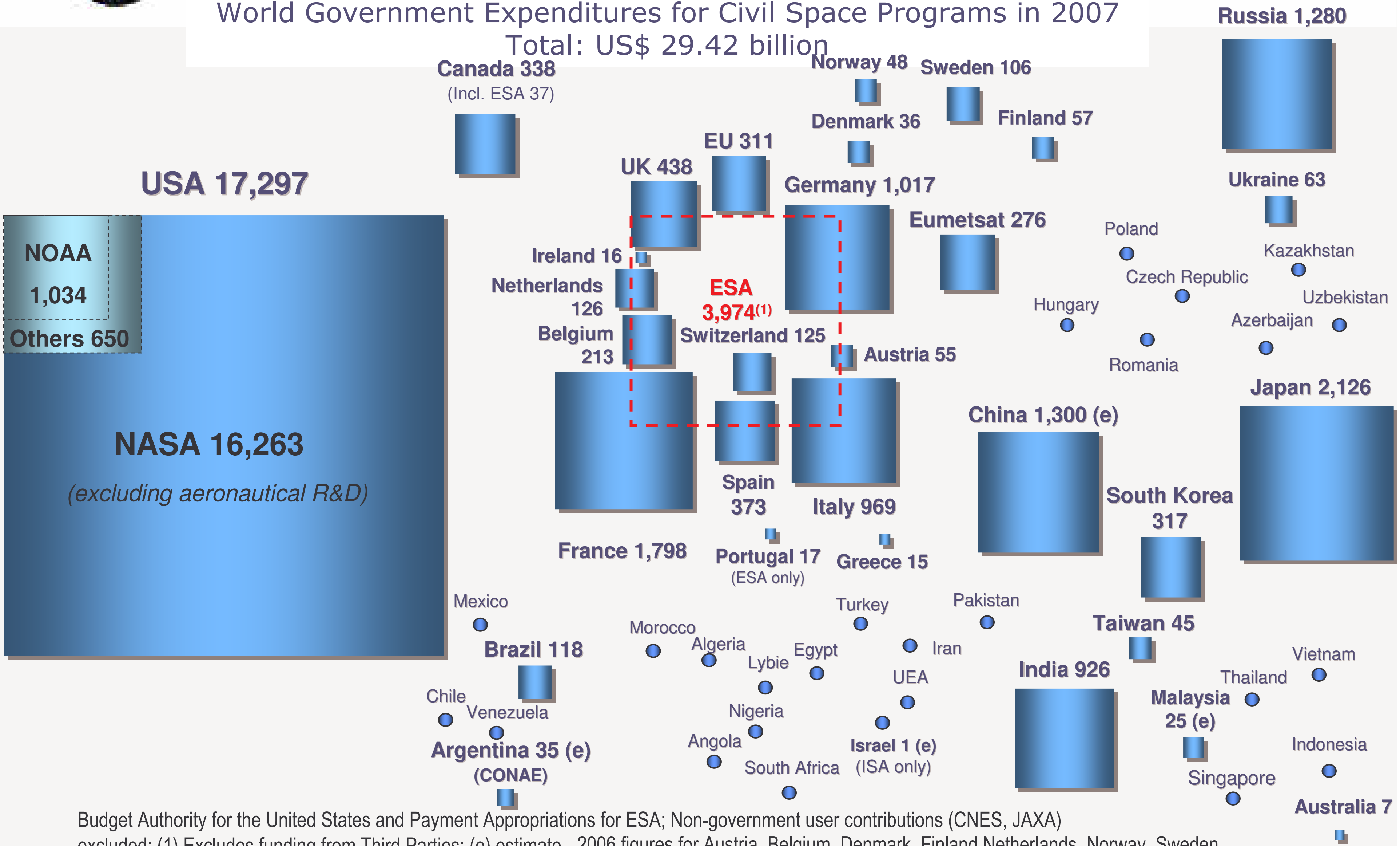
The past....



1990 Civil Budgets for Space* Throughout the World (USD in millions)
United States 12,460
D.o.C 243
NASA 11,985 (excluding aeronautic R &D)
222
Canada
EUROPE 4,000 (ESA + domestic programs)
UK 271
West Germany 789
Belgium 117
Netherlands 102
Sweden 86
CNES 1,263
France 1,263
ESA 2,429
Italy 747
Soviet Union 5,232 **
India 248
ISRO 211
Japan 1,124
NASDA 800
* budget authorization
** 1 ruble = 1.66 $ (official exchange rate as of June 1991)
Non government users' contributions excluded for CNES and NASDA
Source : Euroconsult's ECOSPACE data base
© Euroconsult 1991

...and today

World Government Expenditures for Civil Space Programs in 2007
Total: US$ 29.42 billion



Budget Authority for the United States and Payment Appropriations for ESA; Non-government user contributions (CNES, JAXA) excluded; (1) Excludes funding from Third Parties; (e) estimate. 2006 figures for Austria, Belgium, Denmark, Finland, Netherlands, Norway, Sweden

Source: World Prospects for Government Space Markets, Euroconsult 2007

The landscape of government space programs is changing…

More countries are showing interest for space applications

- ✓ Looking to take the benefits of space applications for their socio-economic development: EO, satcom, science etc.
- ✓ Signing industrial and/or institutional agreements for the acquisition of local capabilities:
  - ➢ Algeria: Alsat-1 with SSTL
  - ➢ Thailand: Theos with EADS Astrium
  - ➢ Vietnam: Vinasat with Lockheed Martin
  - ➢ UAE: Yahsat with EADS Astrium
  - ➢ etc.

This trend has been materialized by the creation of dedicated organisations/space agencies worldwide

- ✓ Algeria, Chile, Malaysia, Nigeria, Vietnam, Turkey, South Africa…

New international leaders

- ✓ China and India have established a worldwide leadership undertaking major national and international initiatives

…resulting in a more complex environment…

Cooperation between emerging countries expands outside the scope of traditional large space agencies

- ✓ China-Brazil (CBERS), Malaysia-South Korea (Rasaksat), India-Egypt (EO, Telemedicine)…

Market players are diversifying with numbers of new entrants

- ✓ Several companies with non-GEO satellite capabilities currently consider entering the GEO market with new product development
- ✓ Several companies with domestic capabilities are now entering the international market

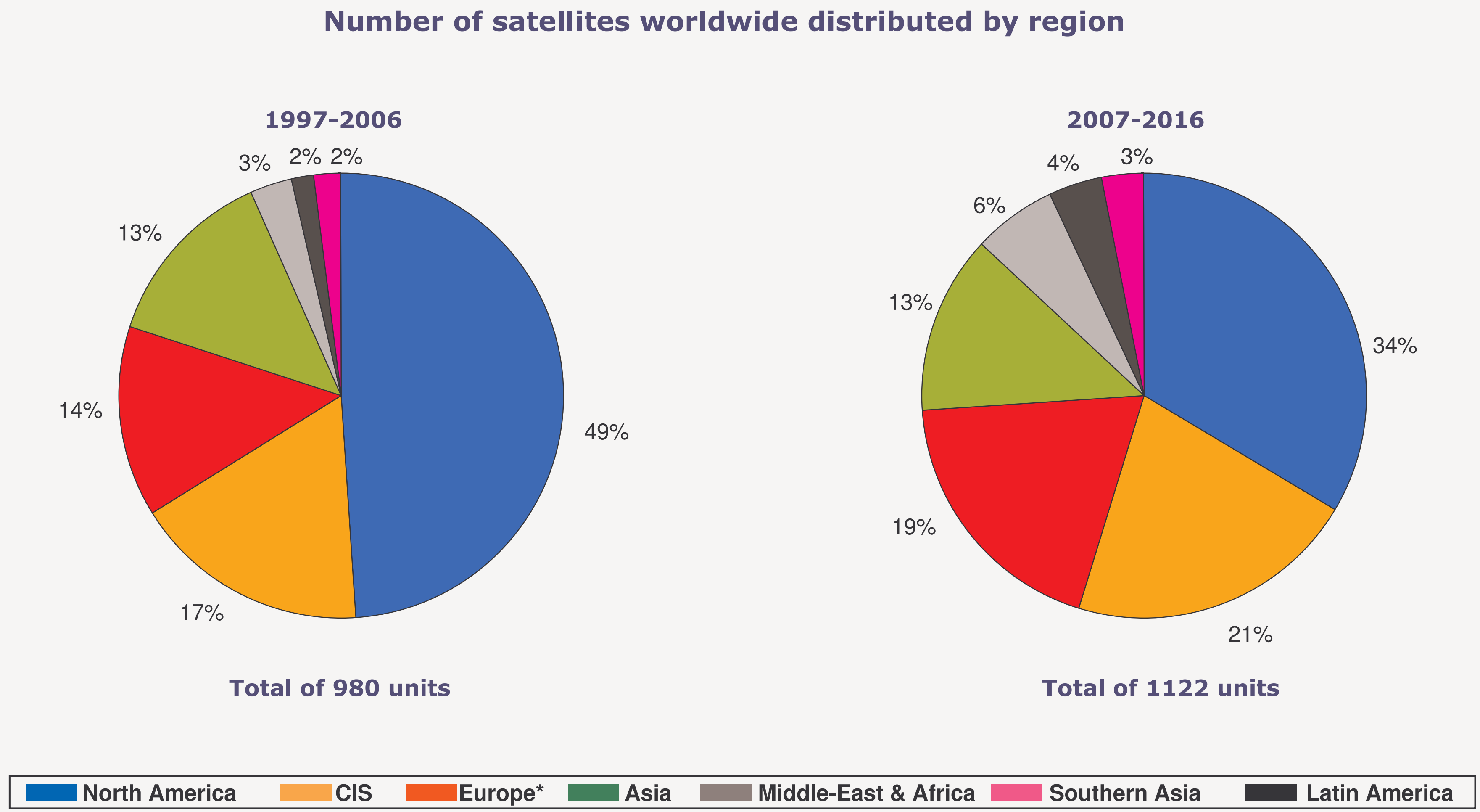
1st Commercial GEO Comsat — 1964

1st Export of GEO Comsat by the US Industry (Palapa) — Mid 1970s

1st Export of GEO Comsat by the European Industry (Arabasat) — Mid 1980s

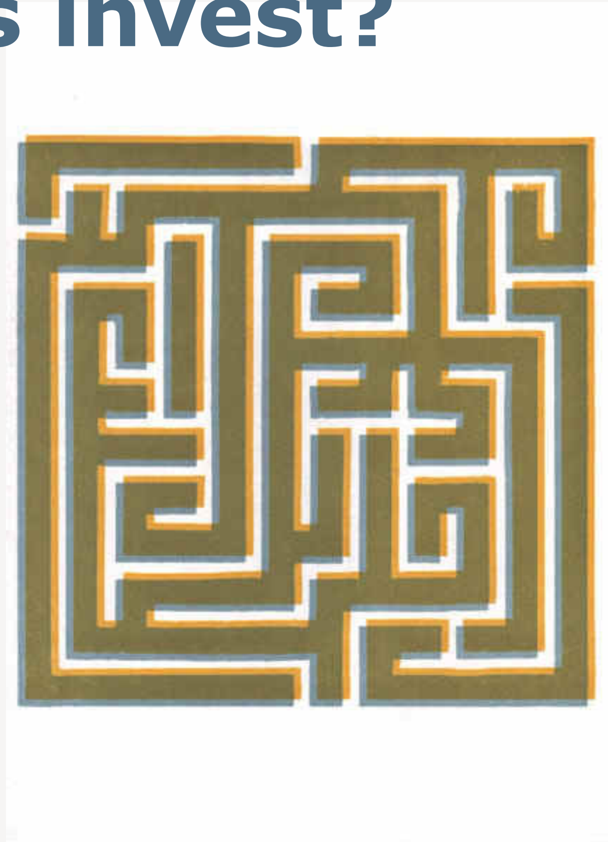
1st Export of GEO Comsat by emerging industries (Nigcomsat, Hylas) — Mid 2000s

Breakdown of satellites by region

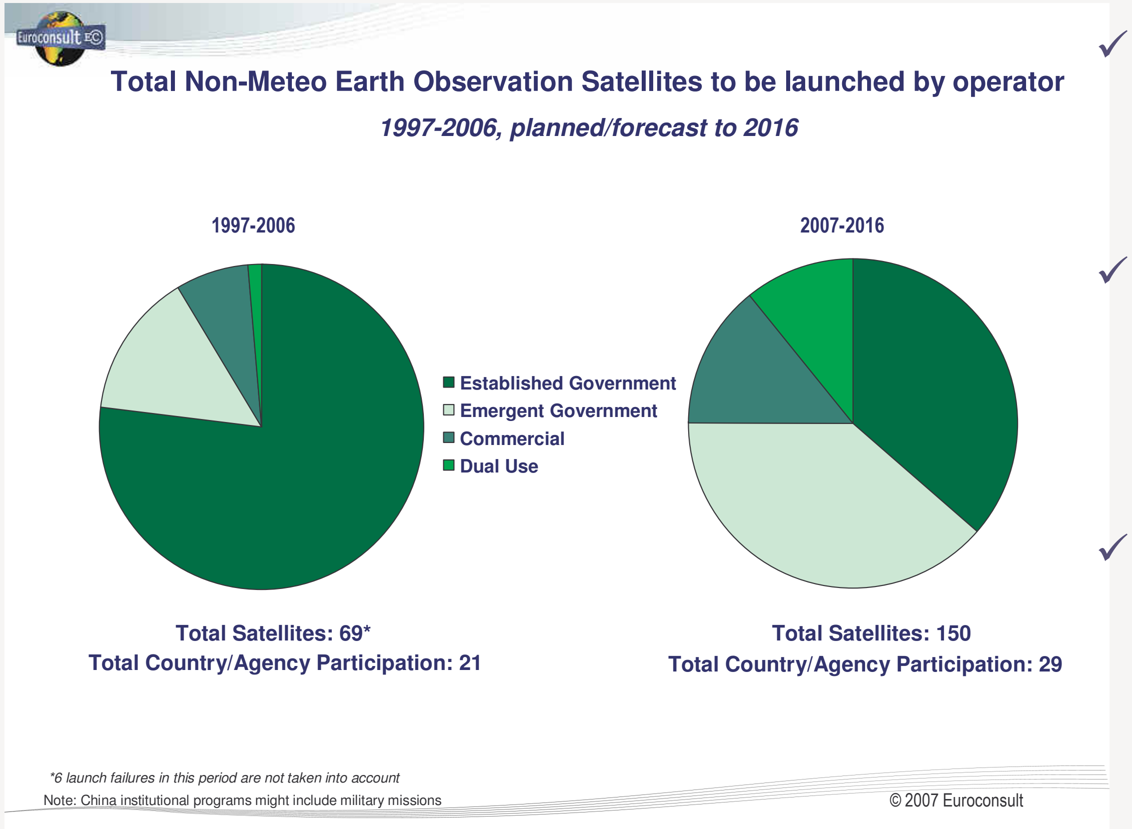


*Including Canada

Where do emerging countries invest?



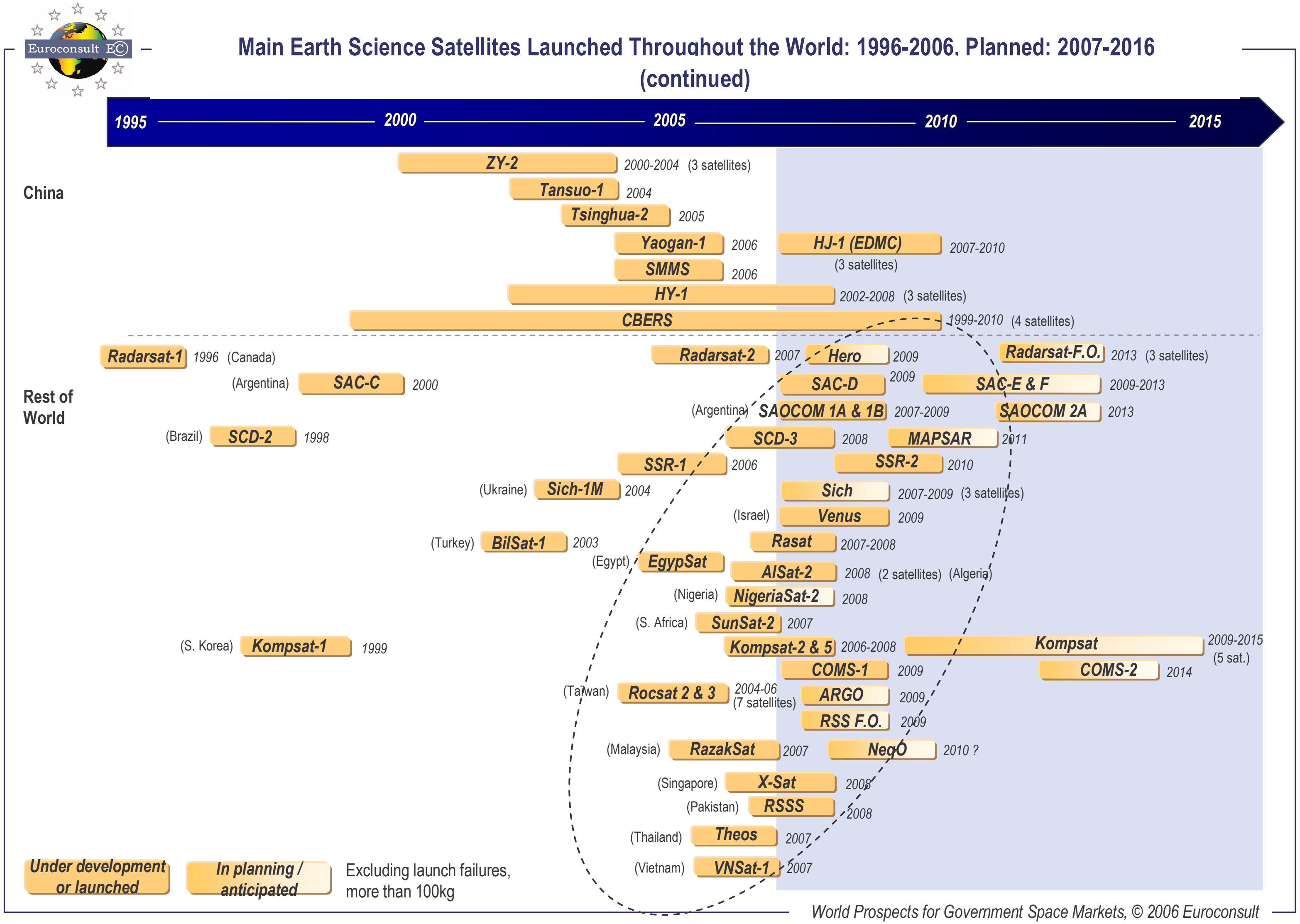
Earth Observation, First



Source: "Satellite-Based Earth Observation, Market Prospects to 2017", Euroconsult 2008

- ✓ Increasing number of satellites coming from emergent national program
- ✓ Up to 1/3rd of sat to be launched by 2016 (compared to 15% the mast 10Y)
- ✓ Low cost satellites with direct return at economic and social level: disaster management, natural resource monitoring and cartography
- ✓ Countries also often look to acquire autonomous satellite capacity (Malaysia, Indonesia and Algeria…)

Earth Observation, First



Satellite applications for direct socio-economic benefits

Satellite communications

- ✓ Provides multiple benefits for the population: Remote communications, Telemedecine, Teleducation etc.
- ✓ May take several form
  - ✓ Access to foreign satcom capacity (from world/regional satellite operators)
  - ✓ Acquisition of domestic system to foreign suppliers (Vinasat, Nigcomsat)
  - ✓ Development of indigenous capabilities (Insat,DHF)
- ✓ Enables also countries to make return on investment by reselling satellite capacity to third parties

Navigation

- ✓ Satnav system cost make it hardly attractive for new coming countries (global system, availability of GPS etc.)
- ✓ Currently only GPS is fully operational. Soon to be completed by Galileo and Glonass next generation
- ✓ Japan, China and India to develop their own system
- ✓ Opportunities for cooperation (e.g. Galileo)

Space for strategic interest

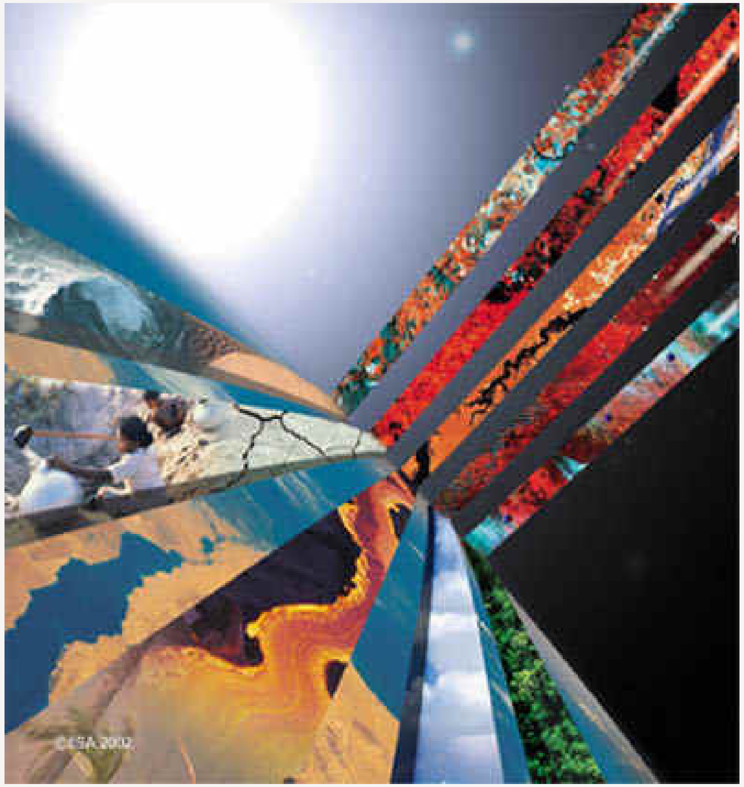
Access to space

- ✓ Level of investment makes launcher development under the realm of a few countries
- ✓ Key drivers: fully independent access to space, strategic consideration
- ✓ 6 countries have domestic geostationary launch capability while four have low Earth orbit capability

GEO capability	Non GEO capability
United States, Russia, Europe, China, India, Japan,	Ukraine, Brasil, South Korea, Israel

Science & Exploration

- ✓ Small scaled science missions often used a driver for cooperation and access to technology
- ✓ Larger programs (Moon, Mars, Deep space…) requires high/long term funding, thus affordable by a few country
- ✓ Countries show new interests in science/exploration: India (Chandrayan), China (Shenzou)



Conclusions

Conclusions

The emergence of new space players is a challenge....

- ✓ For newcoming countries: high tech and complex sector, long term programs and return of investment, need to identify requirements and priorities…
- ✓ For established players: more difficult to follow the sector, multiplication of bilateral programs, need for coordination between initiatives

…. and an opportunity

- ✓ Opens new partnerships at industry and institutional level: eg DMC
- ✓ Bring new capabilities and competencies for space programs
- ✓ For populations, with unique solutions for better accessing information, communicate and share scientific knowledge

THANK YOU

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www.euroconsult-ec.com

About Euroconsult

Established in 1983, Euroconsult has become a world reference for analysis and consulting in high-technology industries with a core expertise in satellite-related applications, ranging from technical supply to final services. Focused on supporting strategic decision making, the company is independent owned and operated.

Euroconsult records 500 customers in 40 countries, of which 300 active each year

Three main lines of services:

Research reports: A permanent team of experts continuously analyse key trends for both satellite applications and the satellite industry, notably through the publication of recurring Research reports

Consulting: Euroconsult has conducted over 450 consulting missions in the satellite sector over the last 20 years for clients located in more than 40 countries. Missions include independent assessment & due diligence for public & private sector projects; Assist private and public organizations in their decision-making process; Market analysis for satellite products and services

World Summits & customized training: the World Satellite Business Week has become the annual meeting place for senior executives from the international satellite industry and financial community to benchmark, do business and network with their partners, existing and prospective clients. The event gathers each year in Paris 450 senior executives from over 175 companies Over 70% CEOs, CFOs, GMs, SVPs, VPs…