

FUTURE SPACE MARKETS

W. Peeters

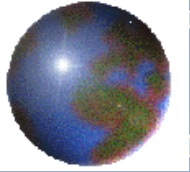
Professor, Space Business and Management

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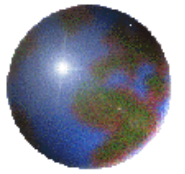
Satfuturis, Tallinn, May 2010

Prof. W. Peeters



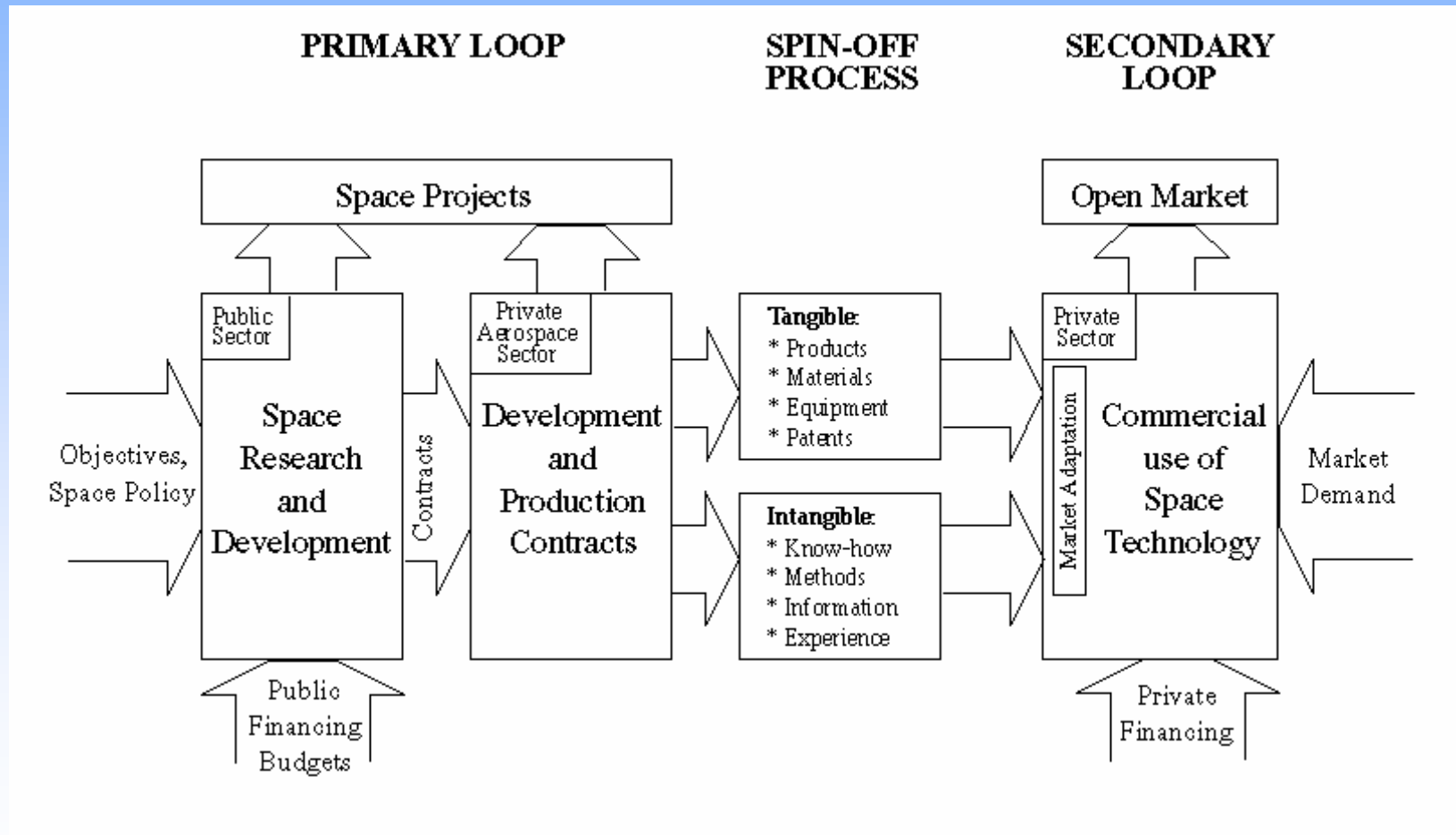
Space Economics : Overview

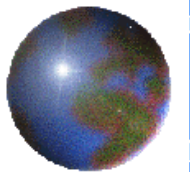
- SPACE BUSINESS
- FUTURE SPACE MARKETS
 - SPACE PRODUCTS
 - SPIN-IN and Technology Transfer
 - GEOGRAPHICAL MARKETS
- CONCLUSION



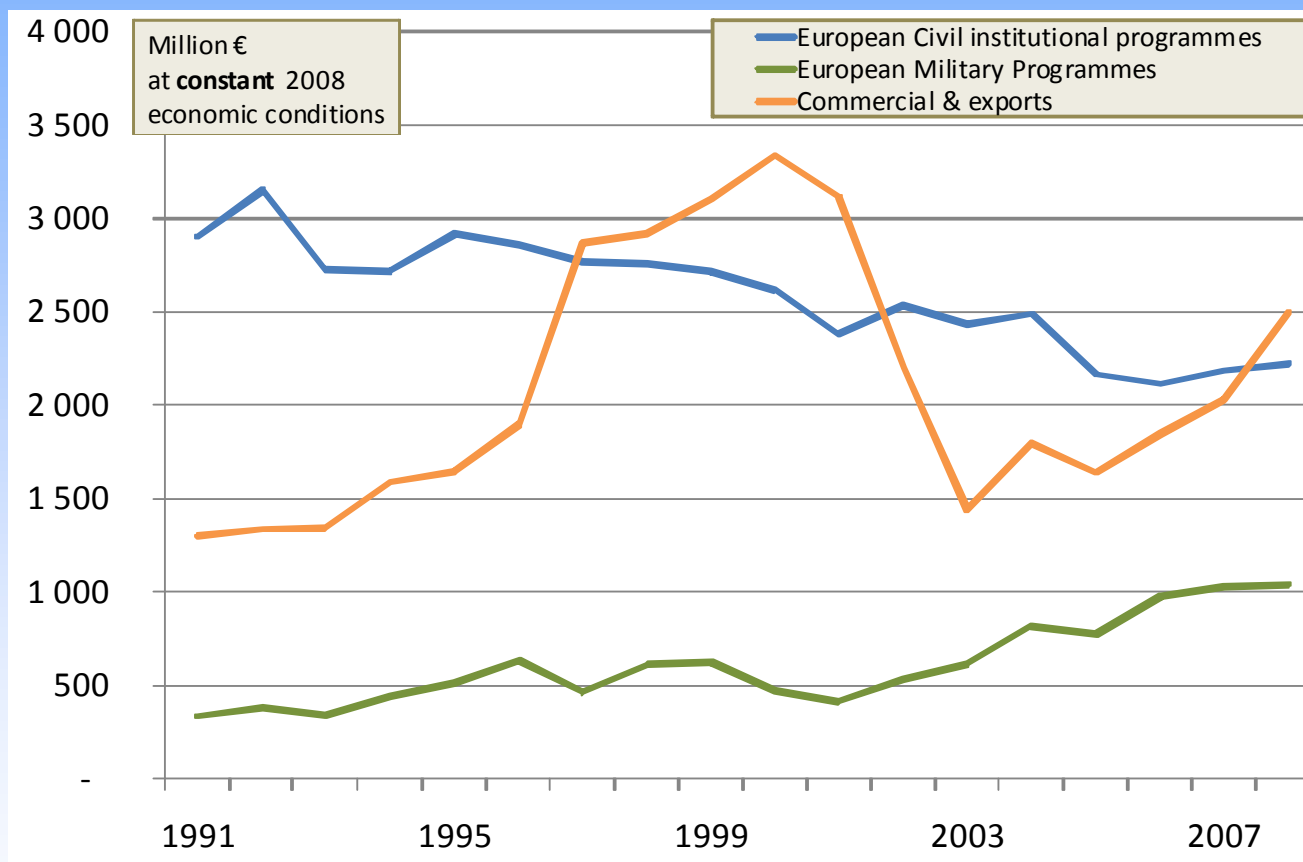
Space Business

Traditional Financing Scenario

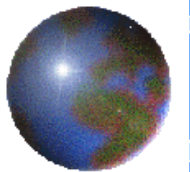




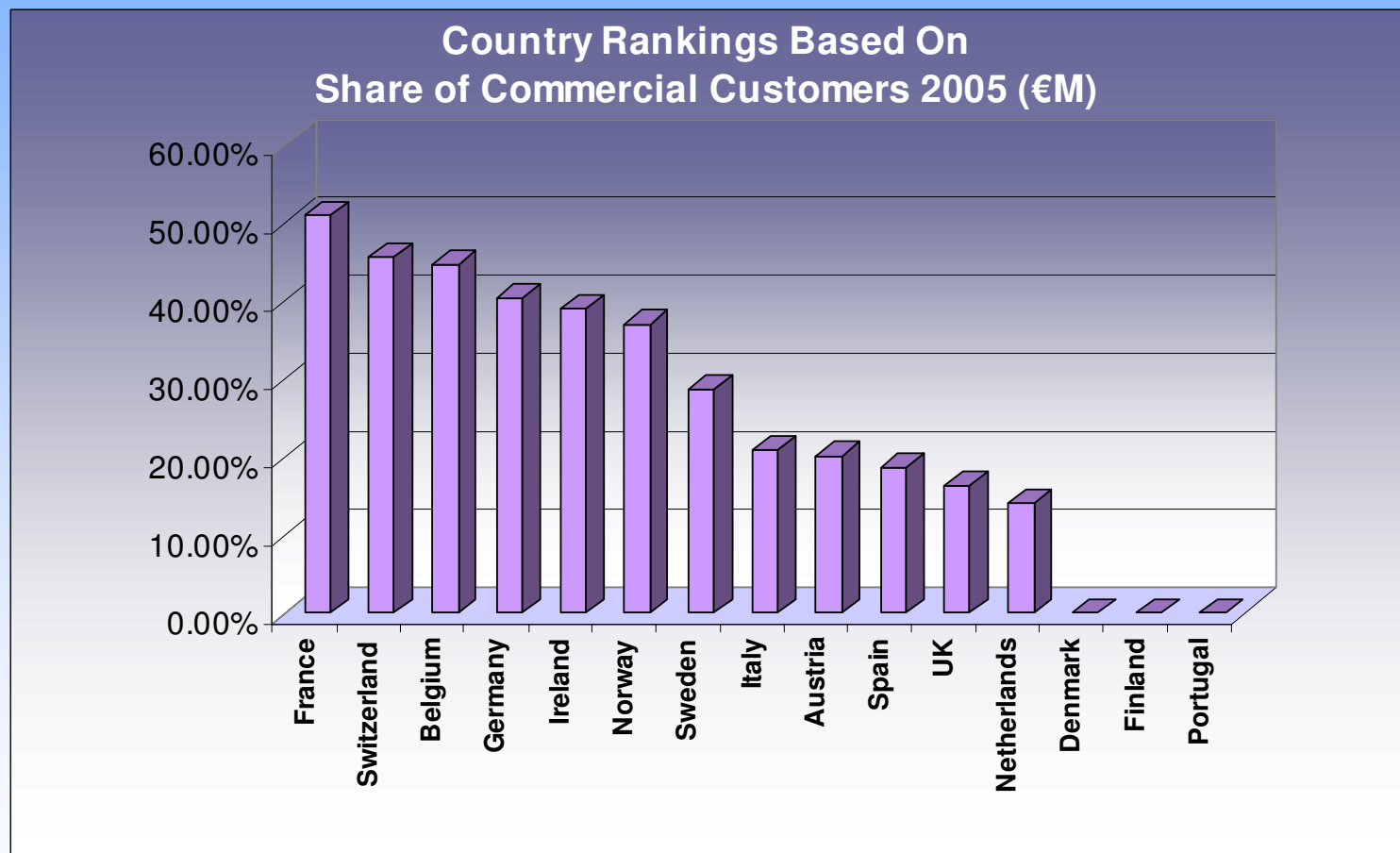
Consolidated Sales (Europe)



(source: Eurospace, 2009)

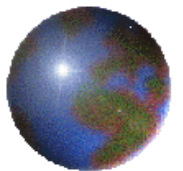


Space Commercialization Evolution in Europe (per country)

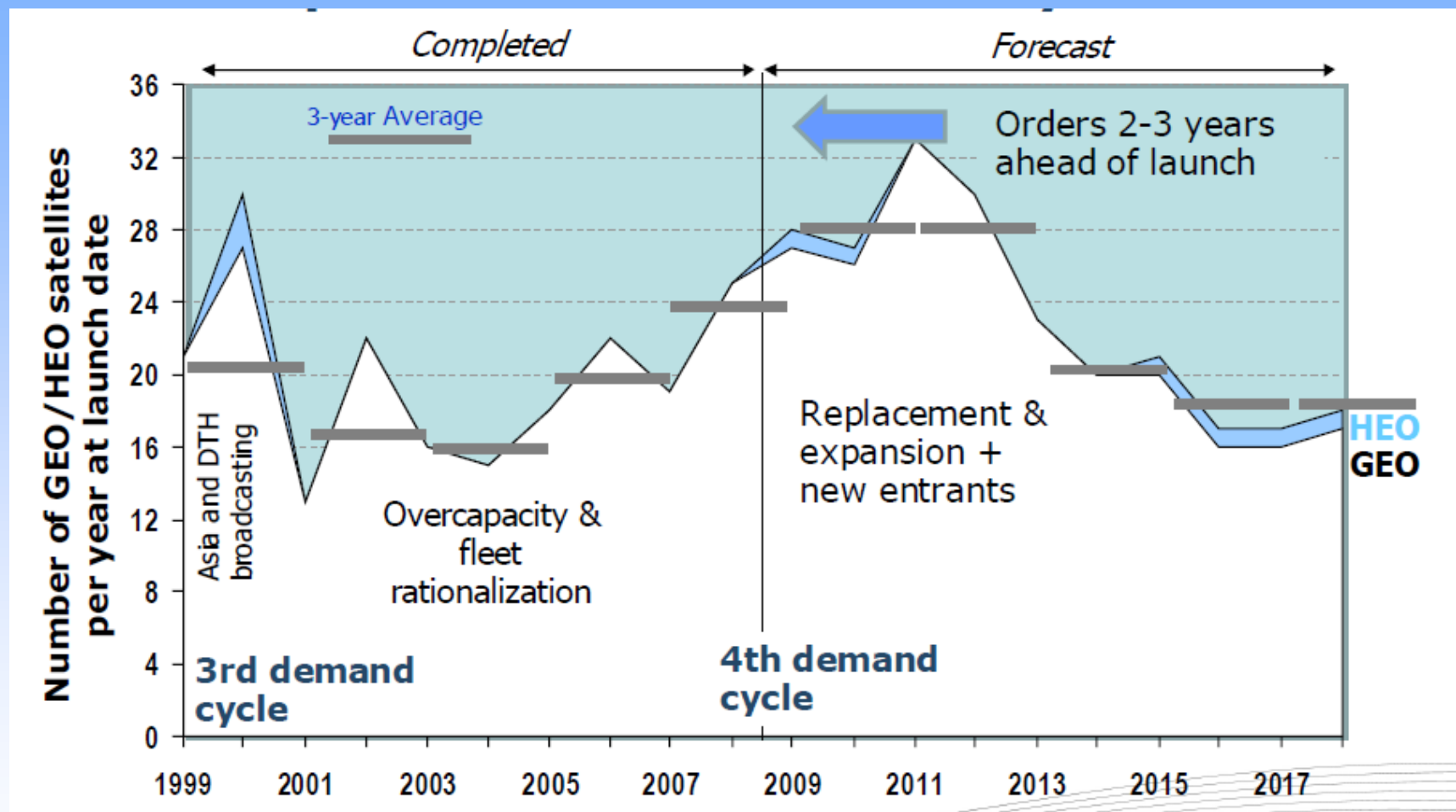


For comparison : USA =
65% commercial sales

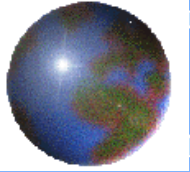
(Source: Eurospace)



Satellite manufacturing forecast

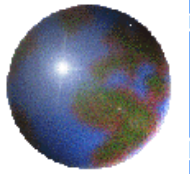


(Source : Euroconsult, 2009)



Future Space Markets

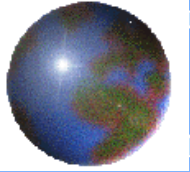
- **NEW SPACE PRODUCTS**
- SPIN-IN and Technology transfer
- **GEOGRAPHICAL MARKETS**



Previous Forecasts

1979	1991	1999 (ESA)	1999 (ISBC)
Space communication.	Sub-orbital transport	Mars exploration	Tourism
Nuclear Waste Disposal	Space tourism	Moon exploration	Solar power
Manufactur. in Space	Solar Power	Solar Power	Tele-operated Satellite Repair
Space Solar Power.	Manufactur. in space	Space Tourism.	Industrial platforms
	Mining		Asteroid mining
	Colonization.		Lunar & Mars stations

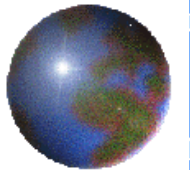
*Prediction is very difficult, especially about the future
(N. Bohr)*



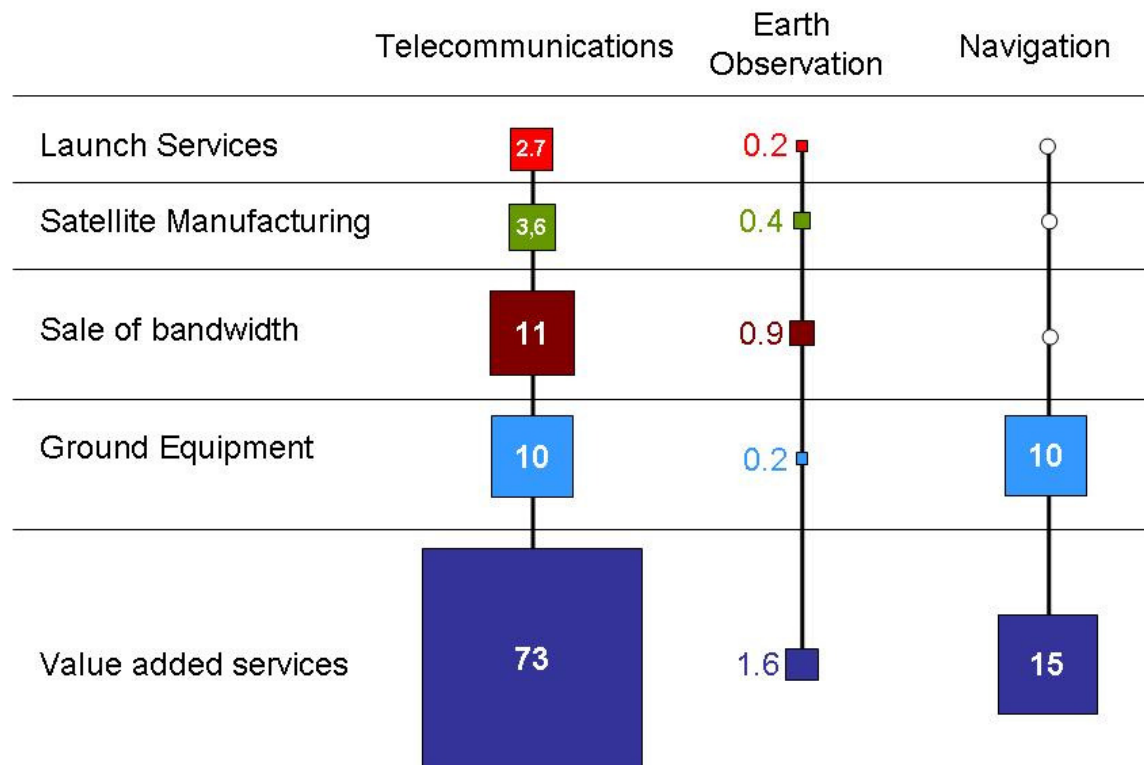
Commercial products not considered...

- Commercial EO services (RapidEye, InfoTerra)
 - Digital radio/TV/Internet in cars
 - Space Advertising
 - MIR/ISS space tourism
 - Space burials
- and...
- Navigation applications (25 billion\$ market)

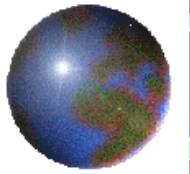
*Overall : Insufficient attention to the value chain
and terrestrial applications...*



Space Value Chain

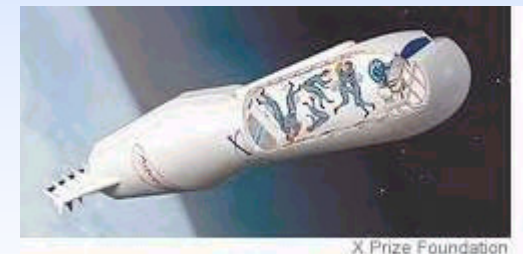


Source: World Market Survey – Euroconsult 2009, in 2008 figures in billion \$

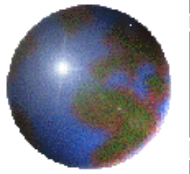


OECD Approach

- **Telecommunications**
 - Telehealth (remote areas, mobile monitoring)
 - Entertainment (HDTV, Interactive TV).
- **Earth Observation:**
 - Fire monitoring
 - Urban planning risk assessment
- **Navigation:**
 - Road user charging
 - Car/truck navigation
- **Space Tourism**
 - Suborbital travel
 - Orbital travel

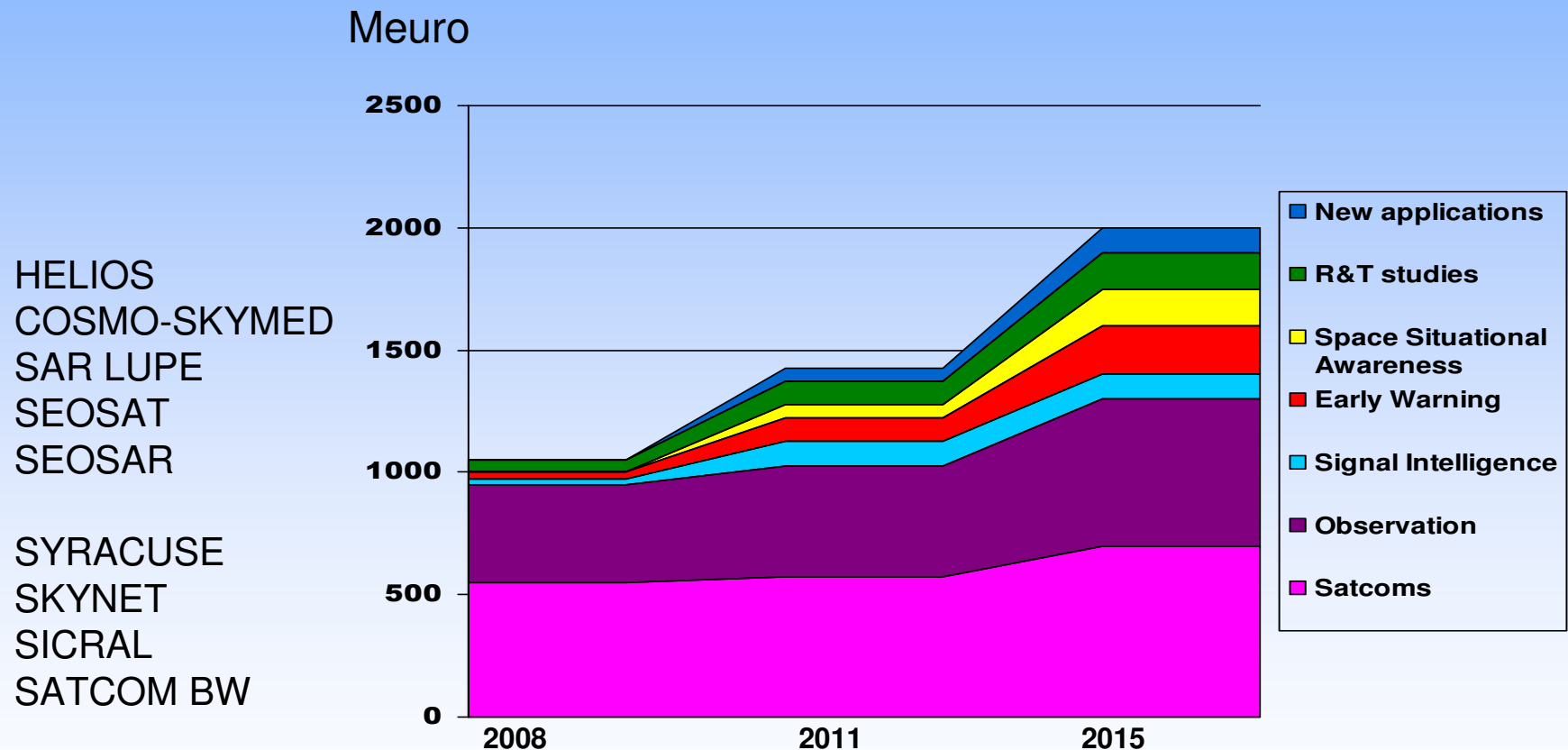


(Source: OECD, 2005)

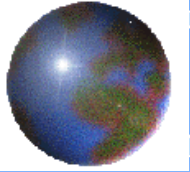


EDA and Space

- European Defence Agency (EDA) Created in July 2004

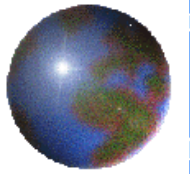


Source : EDA, 2008



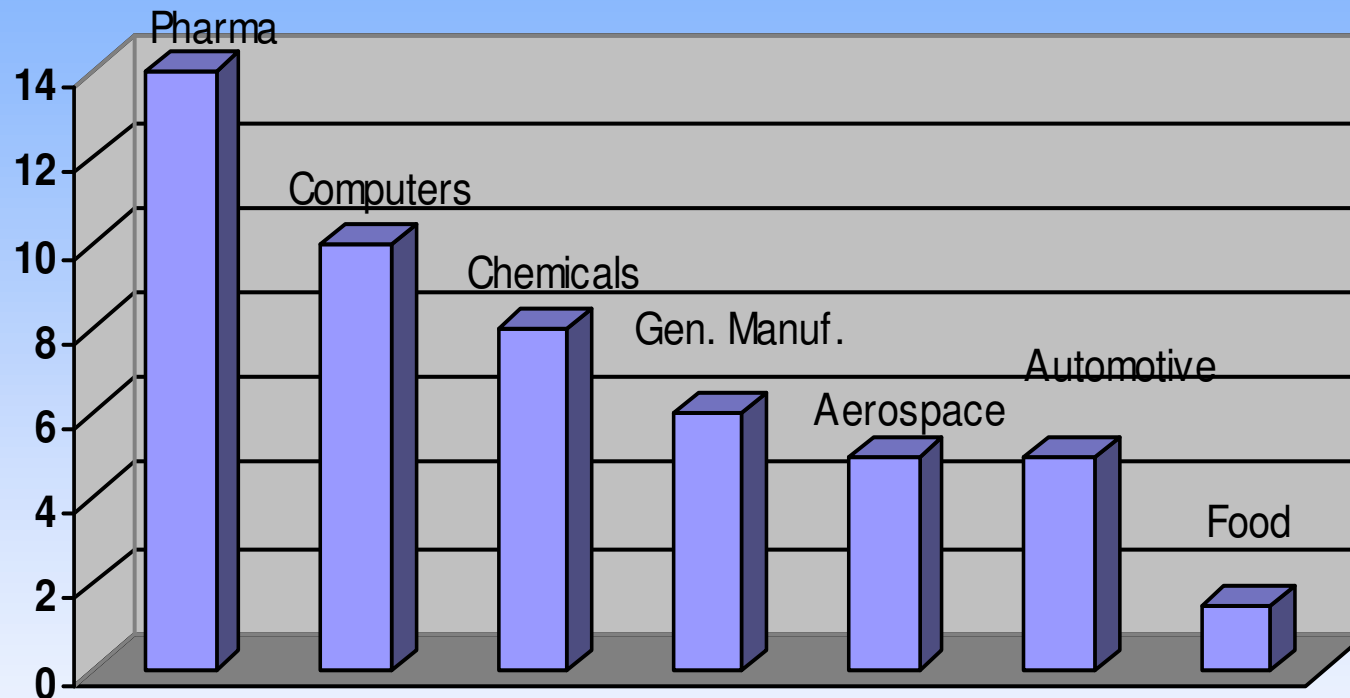
Future Space Markets

- **NEW SPACE PRODUCTS**
- **SPIN-IN and Technology transfer**
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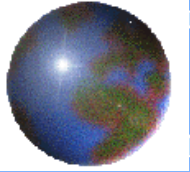


Spin-in Importance (1)

- R&D



**e.g. Research in pharmaceutical :
(Pfizer 4.4 billion USD yearly), equivalent to the worldwide
space sector!**



Spin-in Importance (2)

- **1960s – 1980s**

Space technology leading (cutting edge)

New management techniques developed in space sector

→ Major spin-off effect

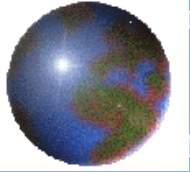
- **1990s - ?**

Budget cuts

Technology life times longer in space

Less globalisation, hence less technology transfer

→ Growth of spin-in



Agency spin-in Mechanisms

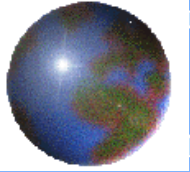
NASA :

NASA (1984) : List of critical ISS technologies to be developed sent out. For approx. half of them useful spin-in responses.

NASA Enterprise Engine (2003): partnership to sponsor innovative, dual-use technologies to support NASA missions.

ESA : Thematic approaches
e.g. Plastic Industry

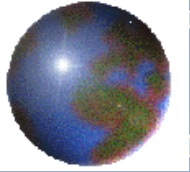




Spin-in Challenges

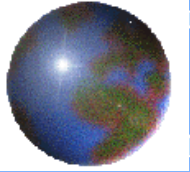
- The space sector uses its own terminology and TLA's
- Space equipment needs to respect a dual environment (out-gassing, radiation, vibrations...)
- The space sector has a particular set of procedures (AIV, PA, contracts, project management,...)
- Natural reaction to be hesitant to introduce spin-in ('not-invented-here-syndrome')

*→ Need for better knowledge of the space sector
(NordicBaltSat FP7)*



Future Space Markets

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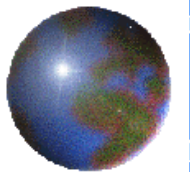


Market share

$$\text{Achievable Market} = S1.S2.TAM$$

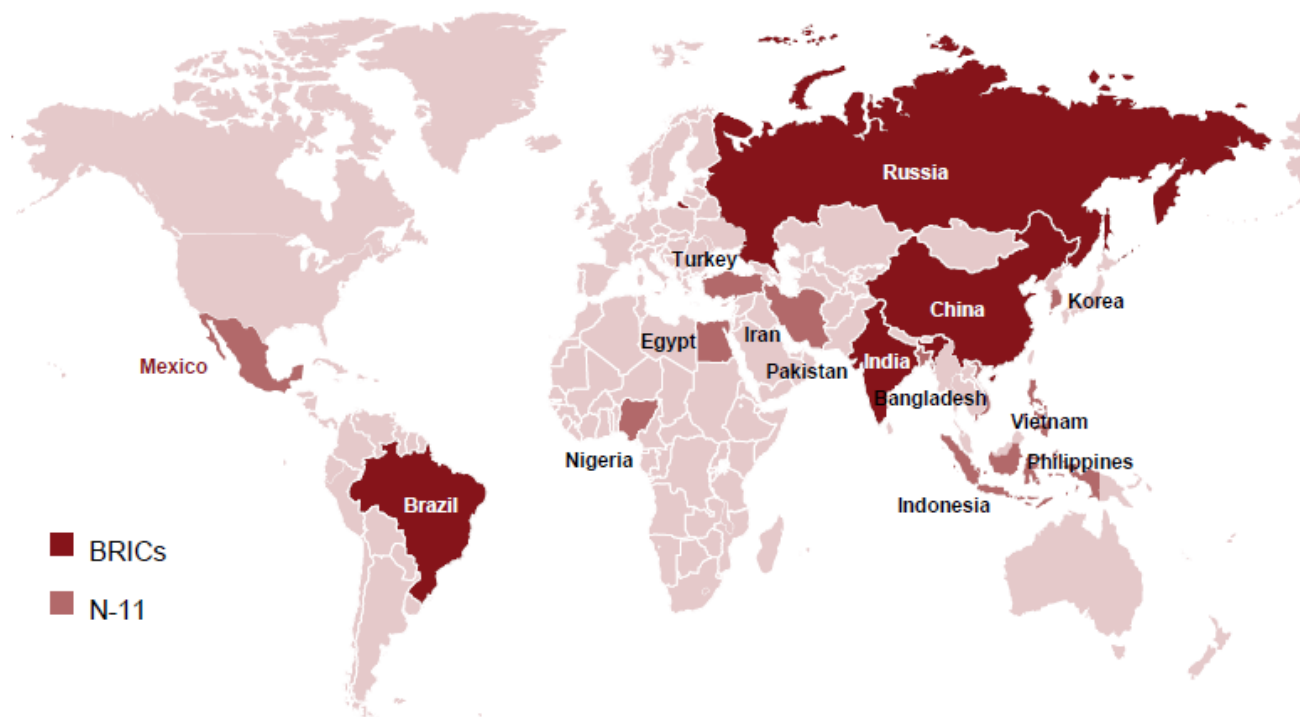
Whereby:

- S1 = the share of the market that can be addressed due to economic or demographic constraints, (Addressable Market)
- S2 = the market share, taking into account competition.
- TAM = Total Available Market

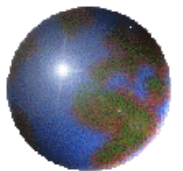


BRIC and N-11 (1)

The BRICs, the N-11 and the World

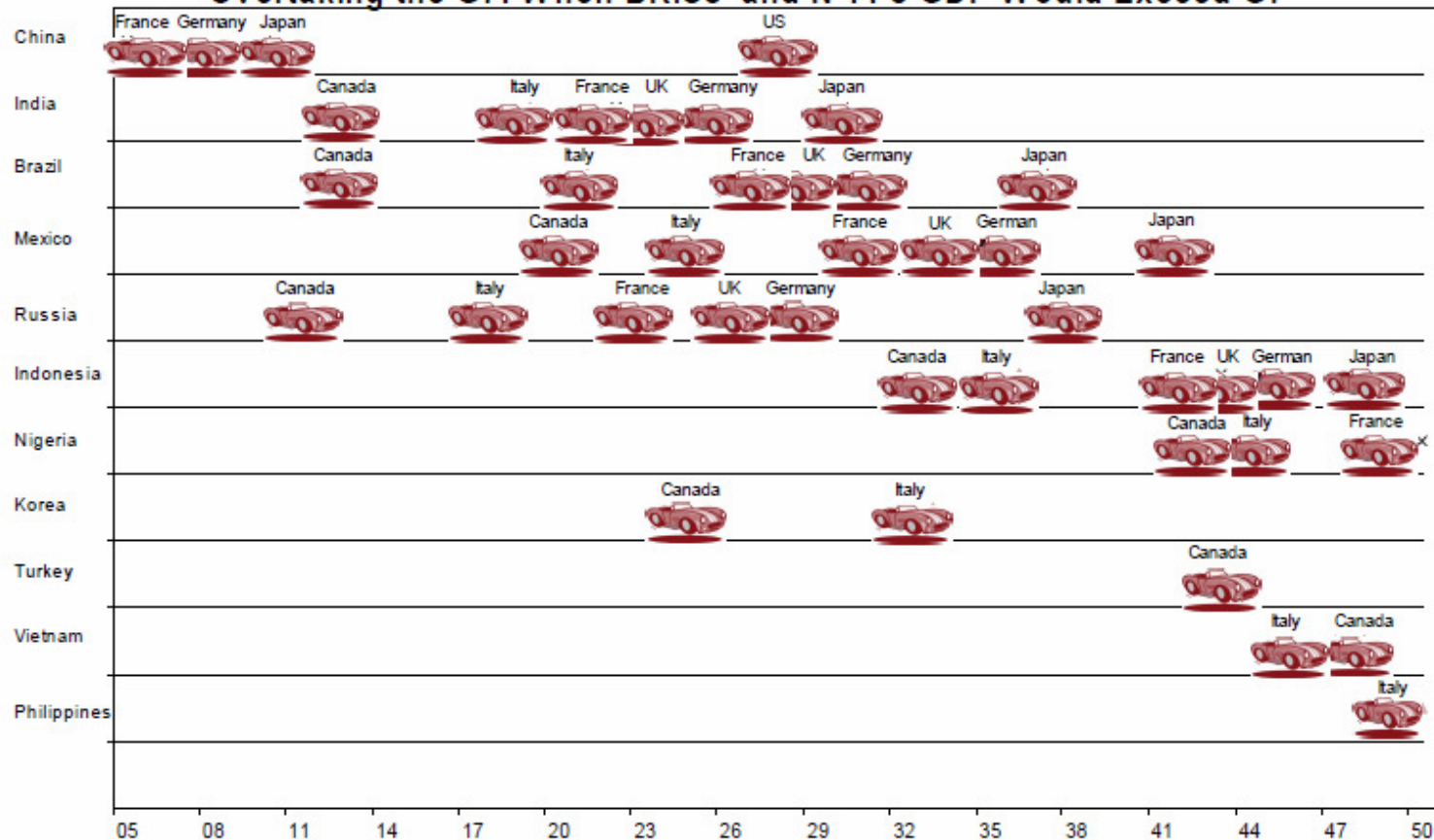


(Source: Goldman-Sachs, 2005)



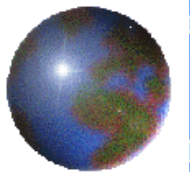
BRIC and N-11 (2)

Overtaking the G7: When BRICs' and N-11's GDP Would Exceed G7



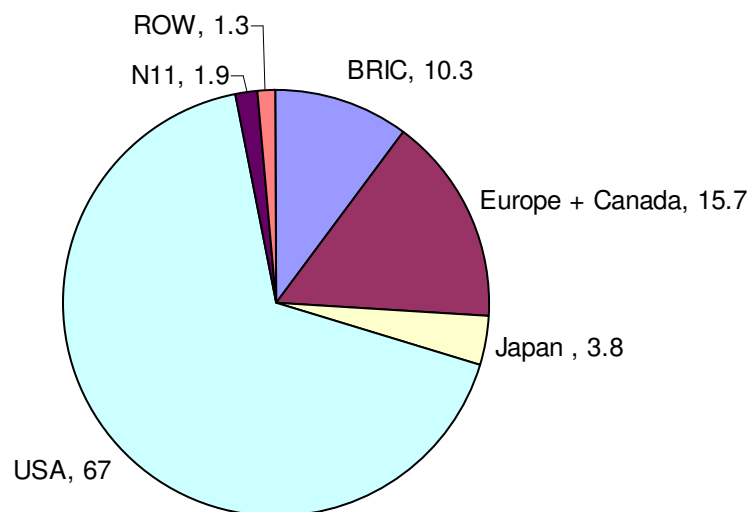
Note: Cars indicate when BRICs and N-11 US\$GDP exceeds US\$GDP in the G7. The N-11 countries not included in the chart do not overtake any of the G7 countries over the projection horizon. Source: GS

(Source: Goldman-Sachs, 2005)



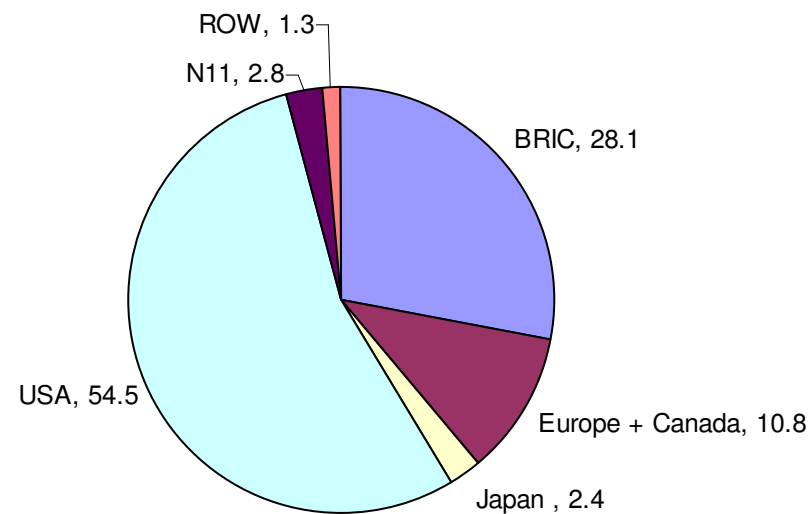
Space Budgets and GDP

Space Budget 2008 - Distribution (%)

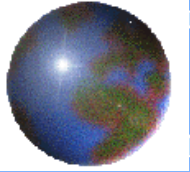


■ BRIC ■ Europe + Canada ■ Japan ■ USA ■ N11 ■ ROW

Projected Space Budget Distribution - 2030 (%)



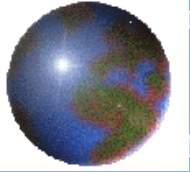
■ BRIC ■ Europe + Canada ■ Japan ■ USA ■ N11 ■ ROW



Financial Crisis Effects

- BRIC and N-11 countries emerging better from the 2008 crisis than the vested space powers
- China, Brazil, India, Indonesia and Philippines came out best from the crisis (infrastructure invest)
→ GDP China = GDP USA already in 2027 ?
- Bangladesh, Egypt, Korea, Nigeria, Turkey, Vietnam confirm performance growth.

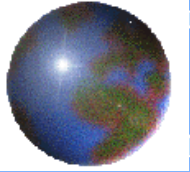
(Source: Goldman-Sachs, 2009)



Feasibility of new markets

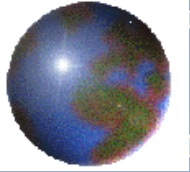
- **Project X:** ←
 - **100,000 USD debt** ←
 - **200,000 USD business angel** ←
 - **Return after 20 years:**
40,000,000 USD ←
 - **IRR : Considerable!**
- **India route, 1492**
 - **C. Columbus**
 - **Isabelle I**
 - **Gold**





Conclusion

- The shift from public to commercial space activities will continue in Europe.
- Space products in the value chain are offering important (under-evaluated) possibilities.
- Spin-in offers new possibilities, but will require improved knowledge of the space sector.
- The space sector is geographically changing, with the necessity to concentrate on new emerging markets (BRIC and N-11).



References

- Web sites (e.g. www.space.com, www.eurospace.org, ...)
- Specialized reports (e.g. FUTRON, Frost&Sullivan, OECD)
- Peeters, W., *Space Marketing* (Kluwer, 2000)
- Peeters, W., *Forecasting the consequences of the 'Crash of 2008' on space activities* (ESPI yearbook, 2009)
- Goldman-Sachs, Global Economics Papers
- ISU, *The Farthest Shore* (Apogee, 2010)