TÜV NORD AEROSPACE

ALTER TECHNOLOGY Member of TÜV NORD

esa esccon 2013 12 - 14 march 2013 European Space Agency

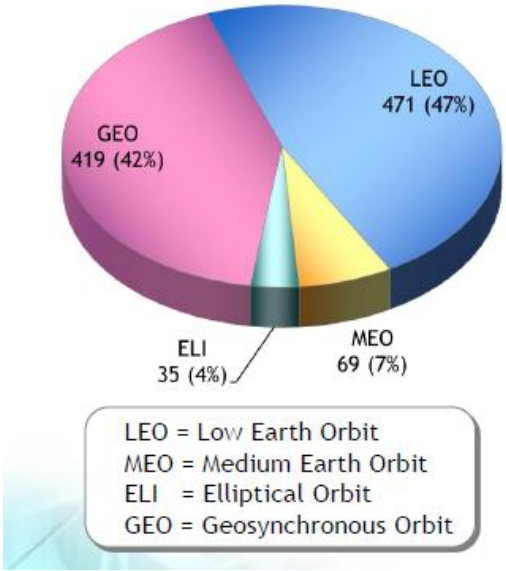
PARTS REQUIREMENTS FROM EMERGING* SPACE PLAYERS

top ARBEITGEBER 2011 INGENIEURE AWARDED BY THE CRF INSTITUTE

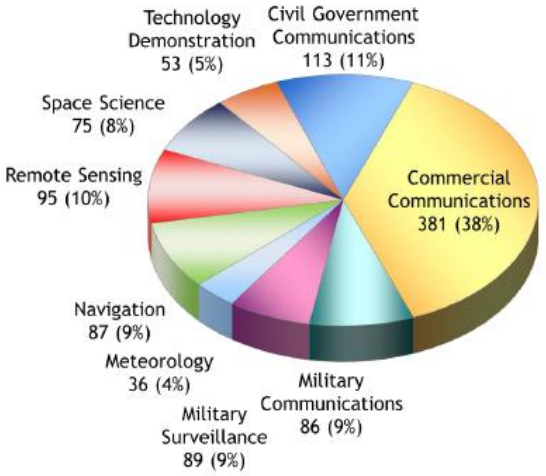
FAIR COMPANY Die bessere Chance für Absolventinnen

* In the global market

FIGURES



OPERATIONAL SATELLITES BY ORBIT

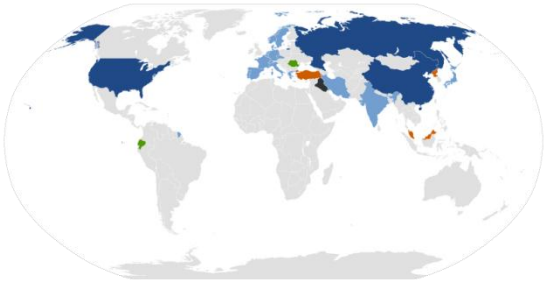


OPERATIONAL SATELLITES BY FUNCTION

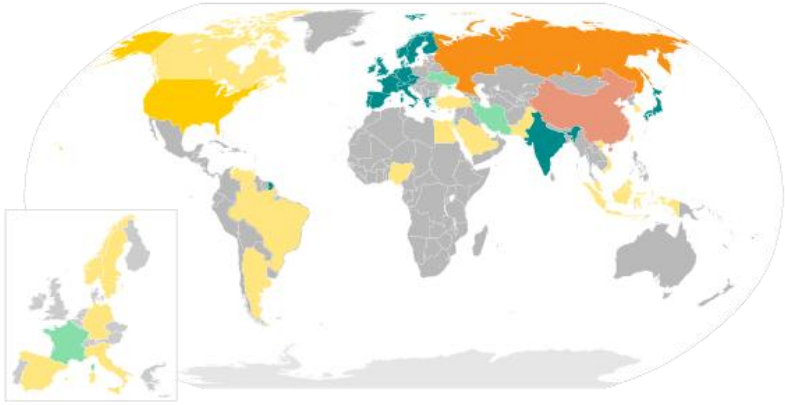
SOURCE: STATE OF THE SATELLITE INDUSTRY REPORT SPONSORED BY SIA

SPACE ACTIVITY

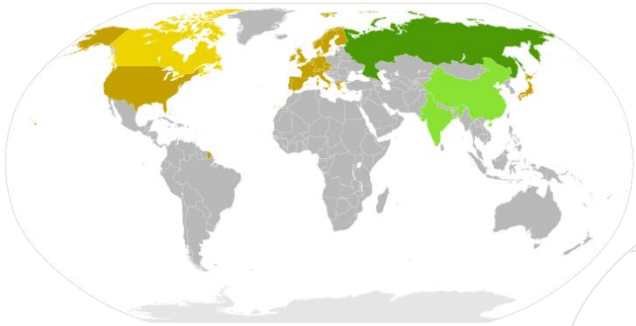
COUNTRIES CAPABLE OF MANNED FLIGHTS



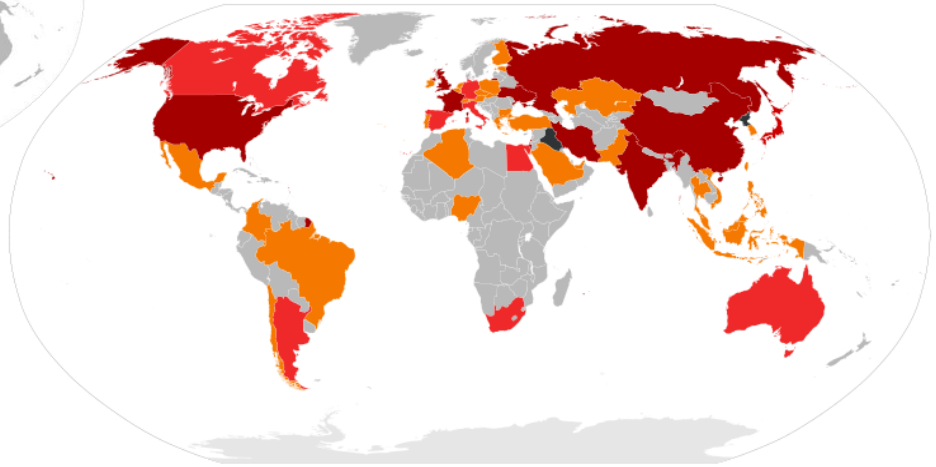
COUNTRIES WITH SPACE AGENCY



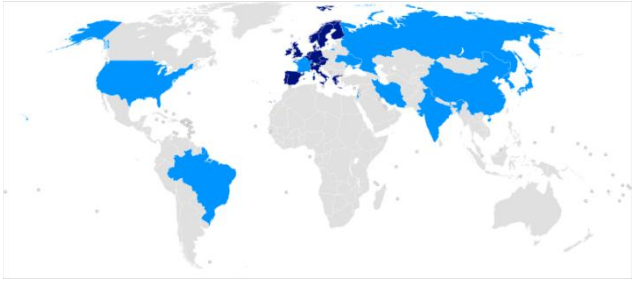
COUNTRIES WITH EXTRATERRESTIAL PROBES



SATELLITE OPERATING COUNTRIES



COUNTRIES WIHT LAUNCH CAPABILITY

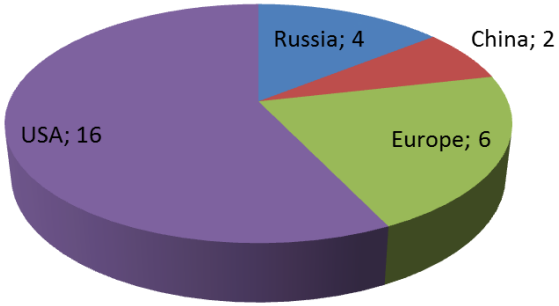


SOURCE: http://http://en.wikipedia.org/wiki/List_of_space_agencies#Expected_future_space_agencies

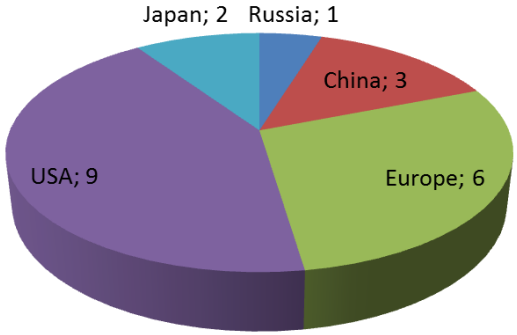
BACKGROUND

GEO SPACECRAFT ORDERS

2010

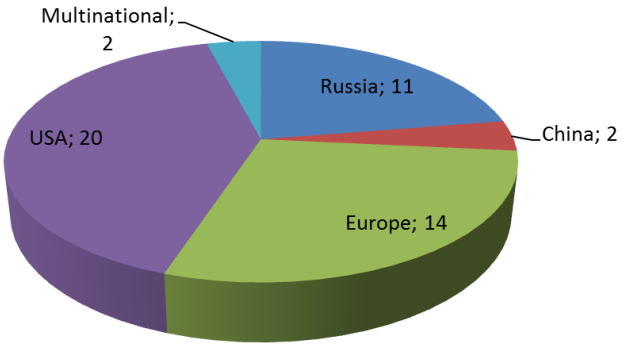


2011

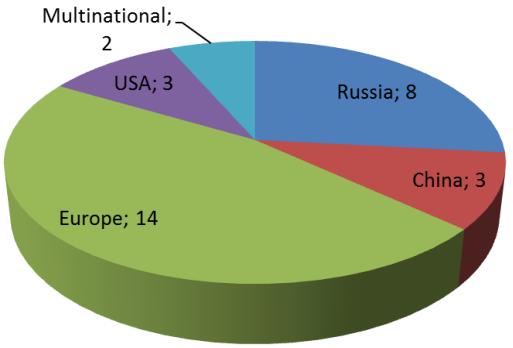


COMMERCIAL LAUNCH ORDERS

2010



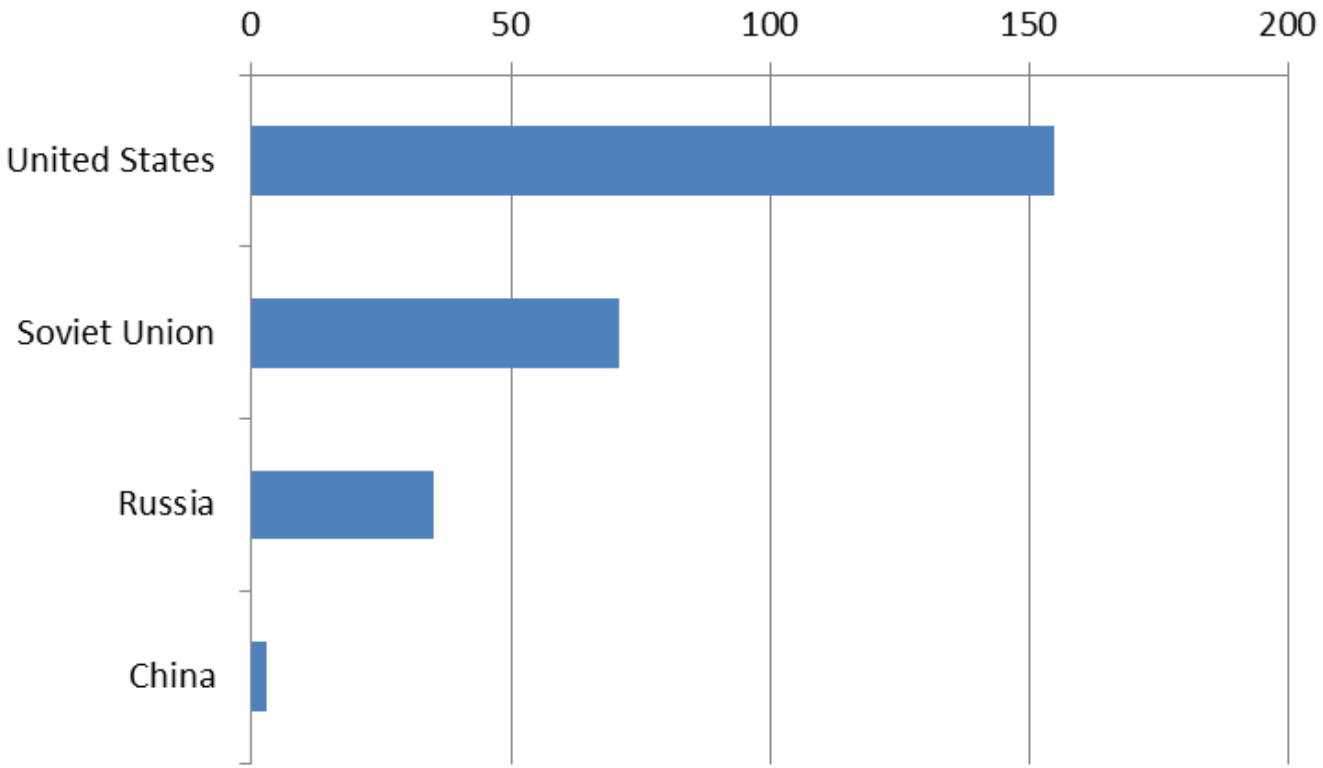
2011



SOURCE: STATE OF THE SATELLITE INDUSTRY REPORT SPONSORED BY SIA

BACKGROUND

NUMBER OF MANNED SPACE MISSIONS



SOURCE: URBIN.DE (STATISTA.COM). YEAR 2009

MAIN SPACE AGENCIES BUDGET

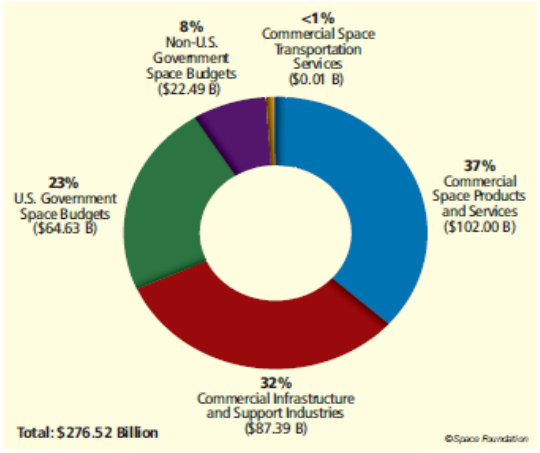
COUNTRY	AGENCY	BUDGET (USD)
UNITED STATES	NASA	17,700
EUROPE	EUROPEAN SPACE AGENCY	5,430
RUSSIA	ROSCOMOS	3,800
FRANCE	CNES	2,822
JAPAN	JAXA	2,460
GERMANY	DLR	2,000
INDIA	ISRO	1,320
CHINA	CNSA	1,300
ITALY	ASI	1,000
IRAN	ISA	500
UNITED KINGDOM	UKSA	414
BRAZIL	AEB	343
CANADA	CSA	300
SOUTH KOREA	KARI	300
UKRAINE	NSAU	250
BELGIUM	BELSPO	170
ARGENTINA	CONAE	148
SPAIN	INTA	135

SOURCE: http://http://en.wikipedia.org/wiki/List_of_space_agencies#Expected_future_space_agencies

BACKGROUND

- Many countries have their own satellites in orbit
- However, many of these satellites are built as turnkey projects with little involvement (if any) of local industry
- Few actors are dominating the global space industry
- This scenario is changing with new space players developing local capabilities and emerging in the global market

GLOBAL SPACE ACTIVITY 2010

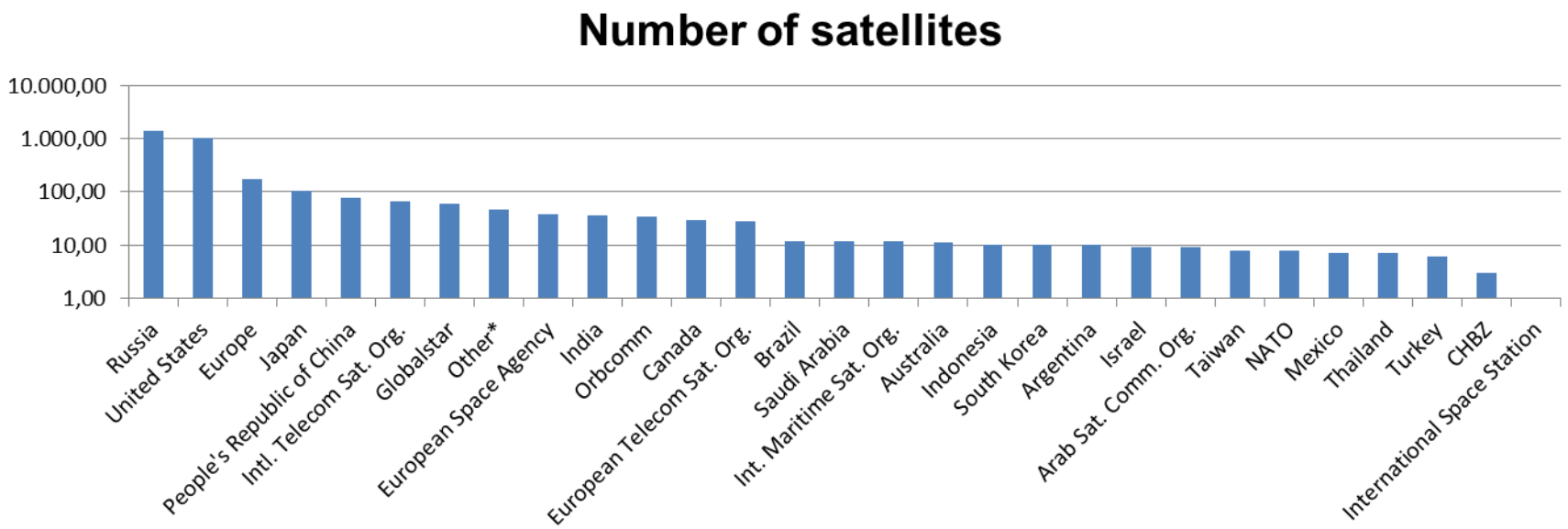


EXPECTED FUTURE SPACE AGENCIES

NAME	ACRONYM	COUNTRY
PAN-ARAB SPACE AGENCY	PASA	ARAB LEAGUE
AFRICAN SPACE AGENCY	AFRI SPACE	AFRICAN UNION
SRI LANKA AERONAUTICS AND SPACE AGENCY	SLASA	SRI LANKA

SOURCE: http://http://en.wikipedia.org/wiki/List_of_space_agencies#Expected_future_space_agencies

BACKGROUND



SOURCE: AIR FORCE ASSOCIATION (STATISTA.COM), 2009

DEFINITIONS

- What is an emerging space player?
- Can we use the same criteria as for emerging economies?
- Can we consider countries with a wide experience in space activity as an emerging player when they were not previously significant actors in the Global Market?
- Which are the common characteristics that must be hold by all players considered as emerging?
- Is domestic equipment manufacturer's industry mandatory to be included as a space player?

EMERGING PLAYERS

We will be focused on countries in accordance with the following characteristics:

- Existing local industry (OEMs)
- Specific space development plans and roadmaps
- Satellite assembly and test capabilities
- Level of participation on competition for turnkey projects
- Newly adoption of western new technologies for electronic components and parts engineering

Under this definition, we will include also countries with a comprehensive space industry when they are becoming a significant actor in the Global Market

EMERGING PLAYERS

Countries considered in this presentation are divided in two categories:

New players into the global market	Emerging countries
Russia	Brazil
China	Argentina
India	Taiwan
Israel	South Korea
	Turkey
	Malaysia
	Indonesia
	Singapore

Discussion will be focused on representative examples of each category

EMERGING PLAYERS

	Domestic generic documents addressing EEE parts selection	Primary EEE parts decision level	Domestic EEE parts industry	Preference on MIL over ESCC system	Specific QA requirements
Russia	Y	Prime	Y	MIL[1]	Y
China	Y	Prime	Y	ESCC[2]	Y
Brazil	N	Agency	N	MIL[1]	N
Argentina	N	Agency	N	MIL[1]	N
Taiwan	N	Prime	N	MIL[1]	N
South Korea	N	Agency	N	MIL[1]	N

1. ESCC parts accepted without restrictions
2. Due to export restrictions on MIL parts but limited due to product availability

RUSSIA

Why:

- Space industry has been mostly devoted to internal needs
- Access to western EEE parts and technologies is now increasing (i.e. GLONASS K)
- Is becoming an active player in the global industry, providing equipment and satellites worldwide. Launcher industry has already undergone that process.

Specificity:

- Important domestic industry on EEE parts
- Official preference on locally produced parts
- Russian EEE parts system and ESCC / MIL system addressing concepts (i.e. reliability) on different approaches as well as qualification for space
- High involvement in EEE parts procurement of intermediate trading companies
- Local requirements for EEE parts inspections

CHINA

Why:

- Space industry has been mostly devoted to internal needs
- Access to western EEE parts and technologies is being constantly increasing since years ago
- Is on the way to become a global supplier already with experience providing equipment, launchers and satellites worldwide

Specificity:

- Publicly defined non dependence policy
- Important domestic industry on EEE parts under development
- Complete EEE parts system under review and construction, with important access limitations to foreign companies
- EEE parts systems similar to MIL / ESCC with main differences based on evaluation and lot validation requirements
- High involvement in EEE parts procurement of intermediate trading companies
- Need of qualification of EEE parts regardless qualification status (MIL / ESCC)
- EEE parts preferences influenced by export restrictions
- Local requirements for EEE parts inspections

BRAZIL

Why:

- Complete process of creation of local space industry, covering all segments including launchers
- Specific plans for satellite production
- Willingness to satisfy local needs as well as becoming a global actor

Specificity:

- Important role of the space agency on industrialization
- Coordinated approach to parts requirements from space agency
- Limited local market size for support activities (i.e. testing)
- No specific QA system. Adoption of ESCC / MIL standards
- Indistinctive usage of ESCC / MIL products
- Major usage of MIL parts (suppliers and MIL system has a wider global presence)
- Dedicated validation processes by project

ARGENTINA

Why:

- Comprehensive capabilities but limited industry development
- Specific plans for satellite production
- Willingness to provide solutions worldwide

Specificity:

- Important role of the space agency on industrialization
- Coordinated approach to parts requirements from space agency
- Limited local market size for support activities (i.e. testing)
- No specific QA system. Adoption of ESCC / MIL standards
- Indistinctive usage of ESCC / MIL products
- Major usage of MIL parts (suppliers and MIL system has a wider global presence)
- Dedicated validation processes by project

TAIWAN

Why:

- Development of local industry focused on few equipment
- Specific long term plans for satellite production
- Willingness to provide solutions worldwide

Specificity:

- Important role of the space agency on industrialization
- Coordinated approach to parts requirements from space agency
- Comprehensive market and capabilities for EEE parts but no specialization on space
- No specific QA system. Adoption of ESCC / MIL standards
- Usage of ESCC / MIL products
- Preference on MIL system since it is better understood and perceived more global

SOUTH KOREA

Why:

- Development of complete local industry
- Specific plans for satellite and launcher production
- Focus on small satellites with willingness to compete on all segments

Specificity:

- Limited role of the space agency on industrialization
- Comprehensive market and capabilities for EEE parts but no specialization on space
- No specific QA system. Adoption of ESCC / MIL standards
- Usage of ESCC / MIL products
- Preference on MIL system since it is better understood and perceived more global
- Companies development is focused on approaching all steps on satellite production

CONTACT DETAILS

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