I progetti della GJU
e le opportunità per le PMI

Stefano SCARDA

Galileo Joint Undertaking

- ***Il contesto programmatico: partenariato pubblico-privato e processo di concessione***
- ***Le applicazioni di Galileo***
- ***Il mercato***
  - ***Meccanismi di "revenue generation"***
  - ***Le proiezioni di mercato***
- ***Sviluppo di business e ricerca: i progetti applicativi***
- ***Le opportunità di finanziamento: il Sesto Programma Quadro della CE***
  - ***Le PMI nel Galileo 6FP***
  - ***Opportunità future***

Overall Schedule

48 months	24 months	20 years
Development and Validation	**Deployment**	**Operations and Maintenance**
1.2 Billion € Public	**2.2 Billion €** 1/3 Public, 2/3 Private	**220 Million € per year** Private
2 Test Satellite & 4 Operational Satellites Ground Infrastructure	26 Satellites Ground Infrastructure	Routine Operations and Replenishment

EC/ESA → Joint Undertaking → GALILEO Concessionaire / Supervisory Authority

The Galileo concession process

- ***Phase I:*** ***Call for Interest (Oct. 2003-Feb.2004)***
- ***Phase II:*** ***Competitive Negotiation Phase (April 2004- March 2005)***
- ***Phase III:*** ***Contract Negotiations***
  Target date: End of 2005

EURELY Consortium *(Core members: Alcatel Participations S.A., Finmeccanica, Autoroutes du Sud de la France, AENA, HISPASAT)*

iNAVSAT Consortium *(Core members: INMARSAT Ventures Plc, EADS Space Services, Thales SA)*

In June 2005, the two consortia have delivered a joint proposal, which was considered positively by the evaluators for starting negotiation with the joint consortium.

The Galileo differentiators

- *Under a regulated entity (Galileo Supervisory Autority)*
  - *To preserve the public interests*
- *In a commercial PPP scheme*
  - *To develop the GNSS market and implement contractual schemes*
- *Technical advatage*
  - *High performance – possible signal encryption and authentication*
- *Integrity*
  - *To monitor the system performance –to verify GOC contractual obligations*
- *Transparency, auditability and record of past performance*
  - *To provide service guarantee and quality of service*

Supervisory Authority and Concessionaire:
To provide a commercial and regulatory interface for all applications

International Cooperation:
Worldwide market and specific regional needs

Compatible and Interoperable with others GNS
to allow dual use GALILEO+GPS

5 different GALILEO Services

To offer "optimised" signals for each application

Top level global performances

Provided by GALILEO alone

GALILEO Local Component
To enhance performances in difficult scenarios

GALILEO application overview

Safety of Life

- Aviation
- Rail
- Maritime
- Inland waterways
- Ambulance
- Police / Fire
- Search and Rescue
- Personal Protection
- Traffic surveillance
- Dangerous goods trans.
- ADAS

Mass Market

- Personal communication and navigation
- Cars / motorcycles
- Trucks & buses
- Light Commercial Vehicles
- Personal outdoor recreation
- Others…

Professional

- Oil and Gas
- Mining
- Timing
- Environment
- Fleet Management
- Asset Management
- Geodesy
- Meteorological forecasting
- Land Survey / GIS
- Precision survey
- Precision Agriculture
- Fisheries / EEZ
- Vehicle control and robotics
- Construction / Civil Engineering
- Space

Integrity (**error-free**), Standards, Regulation, Continuity, Availability, Accuracy

Low costs, Low power cons., Small size, Friendly use, Best perf. accordingly

High precision, High accuracy, High reliability

Transport applications

- ***Aviation***
  - In-flight
  - Approaches
  - Landing
- ***Maritime***
  - Harbour
  - Inland waterways
- ***Railways***
  - Train control
  - Fleet management
- ***Car navigation***
  - Guidance
  - Road tolling
  - Advance Driver Assistance System (ADAS)
- ***Multimodal transport***

GALILEO Added-value: Integrity, accuracy

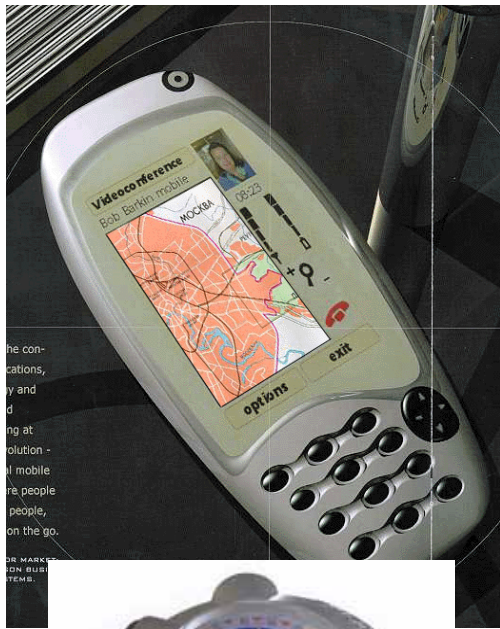
Scientific applications

- *Geodesy*
- *Geology*
- *Meteorology*
- *Vulcanology*
- *Earthquake monitoring*

GALILEO Added – value : increase of number of signals, increase of numbers of GNSS satellites

Mass market personal applications

- *LBS*
- *Fleet management*
- *Car guidance*
- *Sailors*
- *Trekking*
- *Leisure*
- *…*



GALILEO Added – value : increase of availability of GNSS position due to the increase of satellites

Professional applications

- *Agriculture*
- *Fisheries*
- *Forestry*
- *Civil Engineering, Mining*
  - *Structure Monitoring*
  - *Machine Guidance*
  - *Construction Site Management*
  - *Road/Rail Infrastructure Maintenance*
- *Surveying and Mapping*
- *Energy*
  - *Network Synchronisation*
  - *Infrastructure Mapping*
  - *Oil Rig Anchoring*
  - *Seismic Exploration*
- *Timing and synchronisation*
  - *Banking*
  - *Electricity network*
  - *Communication network*

GALILEO Added – value :

higher accuracy, service guarantee, authentication, integrity

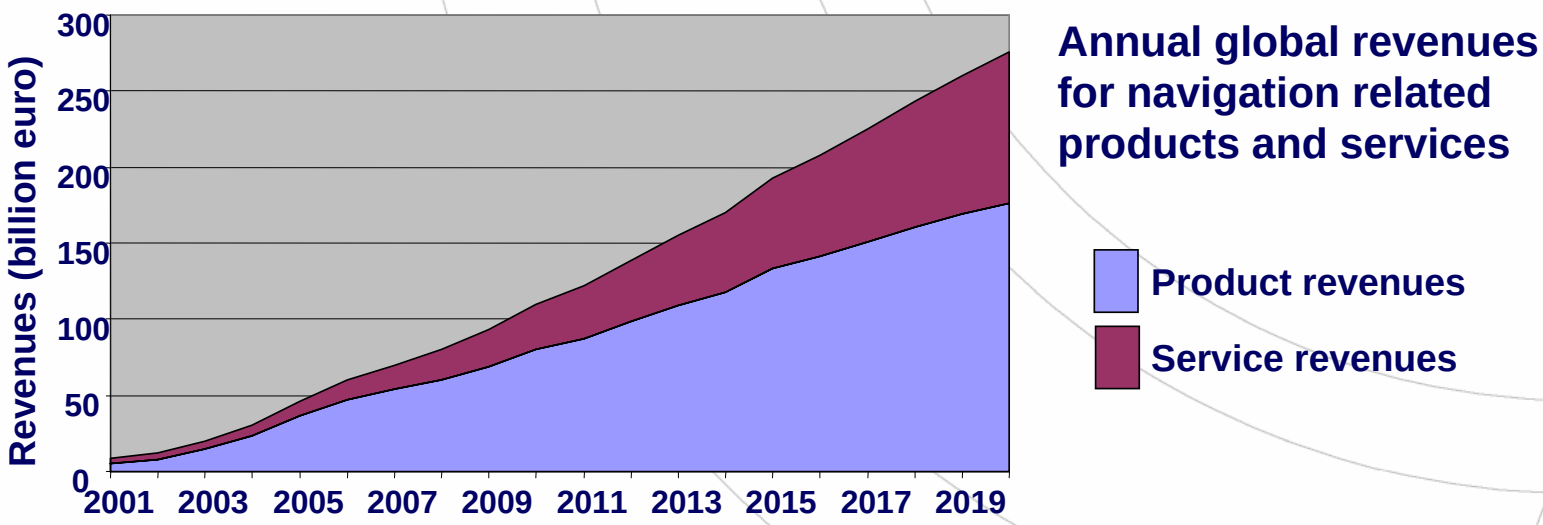
Law-Enforcement

- *Fisheries and marine resources monitoring*
- *Dangerous and valuable goods transportation*
- *Customs support*
- *Emergency call (E-112 and E-Safety for cars)*
- *Anti–fraud support (agriculture for parcel measurement, milk, custom)*
- *Speed control*
- *Livestock tracking*
- *Disaster relief operations support*
- *Humanitarian Aid operations support*

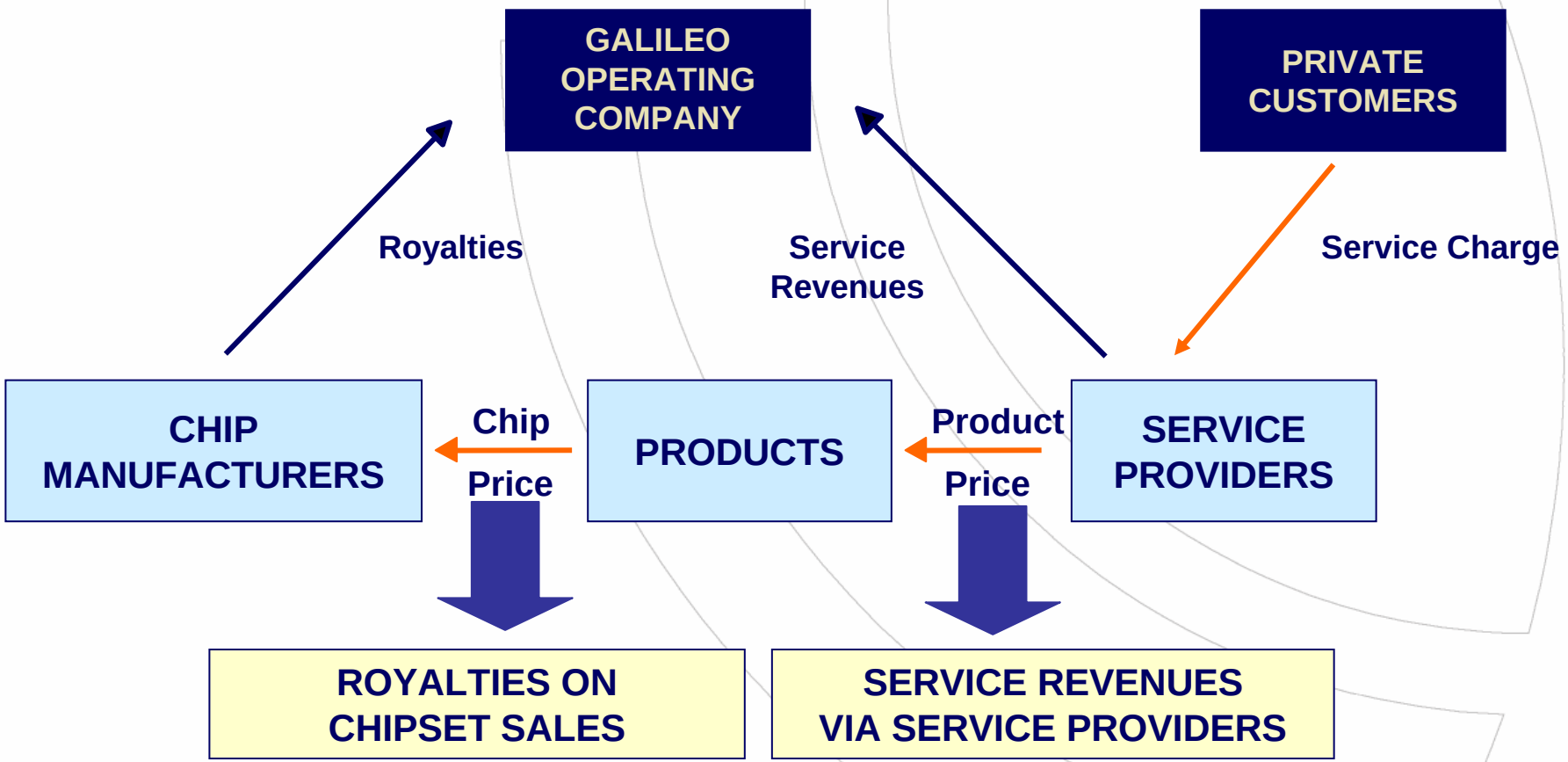
The market for Galileo

GALILEO Markets

- *Market Development*
  - *By 2020 3.6 billion users of satellite navigation products*
  - *Potential for revenues of >€250 Billion per annum*



Potential Revenue Scheme



Source: PWC Final Report 2003

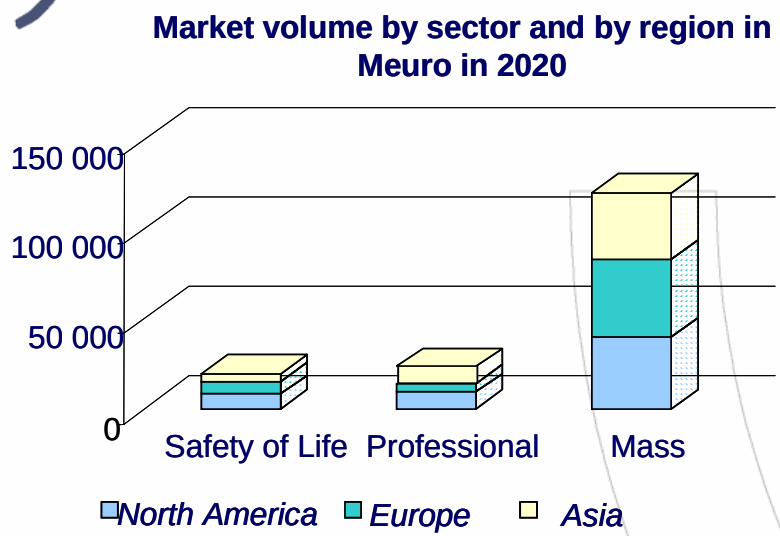
Overview of GALILEO Revenues

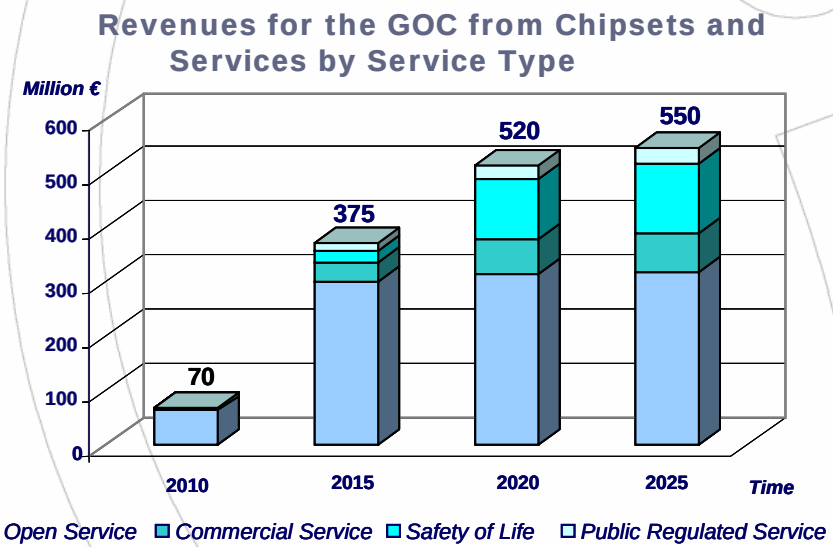
- *Collected at receiver/equipment level at selling time*
  - *IPR on chipset/receiver/equipment*
  - *IPR on the Signal/Quality of Service*
  - *Activation fees*
  - *Type approval, certification,*
  - *Others….*

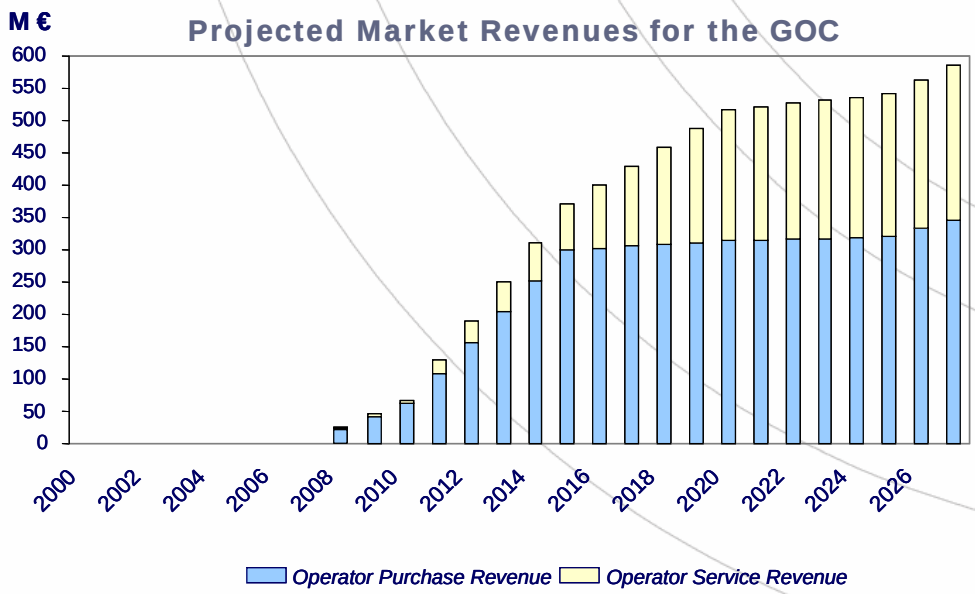
- *Satellite Services*
  - *Service fees*
  - *Service level agreements with users communities*
  - *Others….*

- *Non-satellite Services*
  - *Service Level agreements with added value service providers*
  - *Service guarantee*
  - *Raw data provision*
  - *Local Elements based services*
  - *Others….*

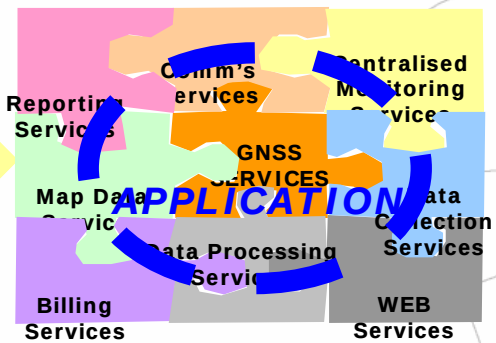
Market volume







GALILEO Applications



- *An application is the result of the availability of different components in addition to the Signal in Space, examples:*
  - *User Receiver*
  - *Additional functions at User level (hybridisation, communication, other sensors)*
  - *Application software and Man Machine Interface*
  - *Local Elements (pseudolites, wireless communications, A-GNSS, indoor navigation)*
  - *Maps and GIS data*
  - *Added values data depending by the specific application (traffic real time info, meteo, point of interest)*
  - *Certification and/or regulation frame (if applicable)*

GNSS Applications Oriented Project

- ***Summary of on-going EC/ESA Projects/Studies (1)***
  - ***Road (22 projects): projects aimed to introduce GNSS on car guidance, fleet management, road charging and advanced future technology for intelligent navigation***

  - ***Rail (13 projects): a big effort is made to demonstrate the potentiality of GNSS for safety improvement in this domain and support to European Standards***

  - ***Maritime (14 projects): control/monitoring of dangerous goods transportation, harbor safety critical maneuvers, in-land waterway navigation, support to IMO standards for vessels Automatic Identification System (AIS)***

Pictures are indicative only, not exhaustive

GNSS Applications Oriented Project

- *Summary of on-going EC/ESA Projects/Studies (2)*

  - *Personal Nav (21 projects): GNSS/Mobile phone integrated solutions for "location based services", emergency call, civil protection personnel/assets management, blind support, child/people tracking*

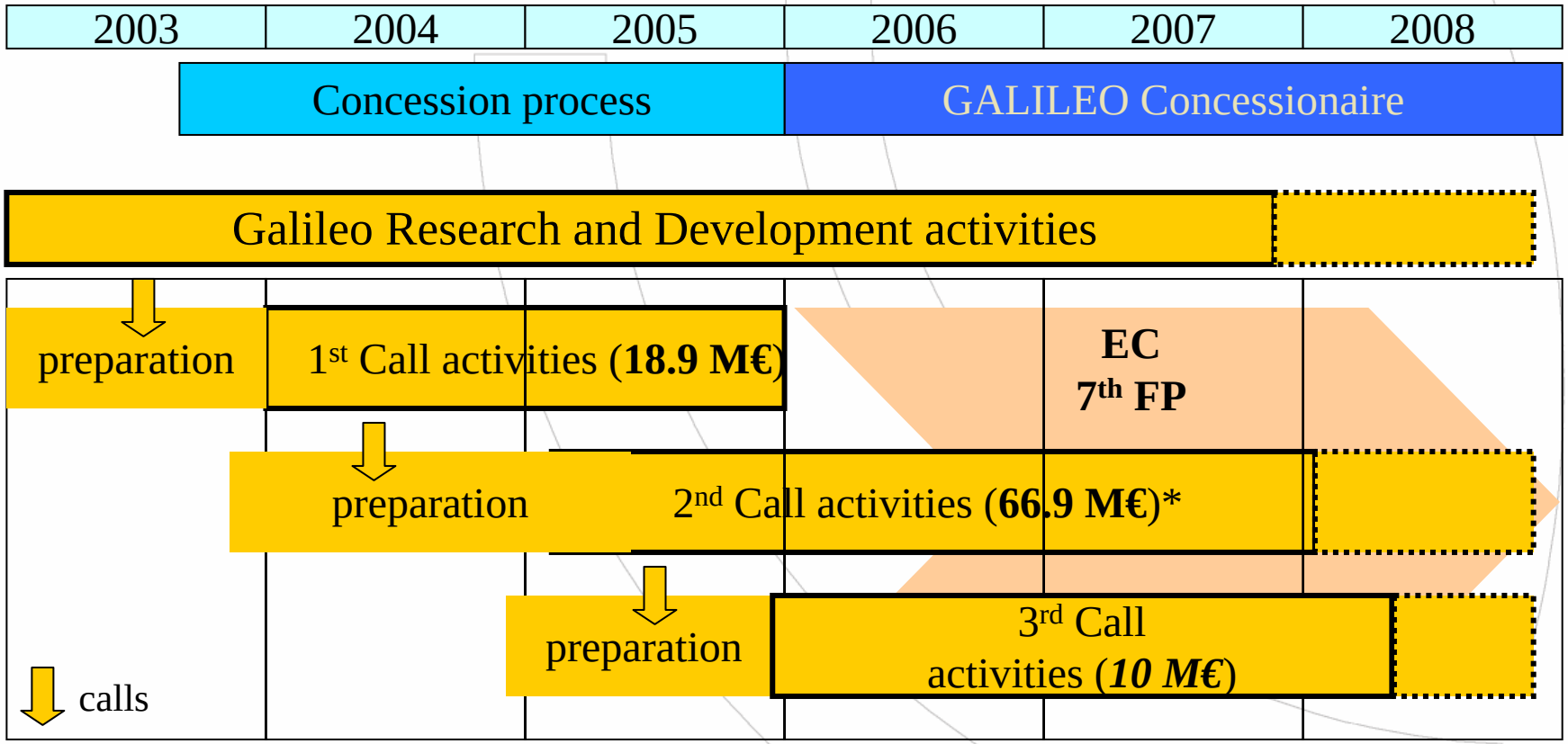
  - *Aviation (8 projects): classical navigation for aviation, airport ground movement management, helicopters nav, support to international standards*

  - *General: "horizontal" issues like standards, market, regulatory and legal aspects of GNSS services*

  - *Others: emerging new applications (precision farming, timing, law-enforcement)*

Galileo 6th Framework Programme Research and Technology Development

Overall Plan



* + additional budget 13.7M€

The EU approach to the SME

- *Europe has set clear targets for growth*
  - *Clear link with innovation*
  - *SMEs are instrumental*

- *Need to stimulate European business to innovate in Galileo*
  - *Network and promote co-operation at transnational level*
  - *Support SME participation beyond their traditional involvement in R&D*
  - *Underpin the development of new services*

- *Need to create bridges between innovation and research actors*

Small and Medium Enterprises

Innovation by SMEs

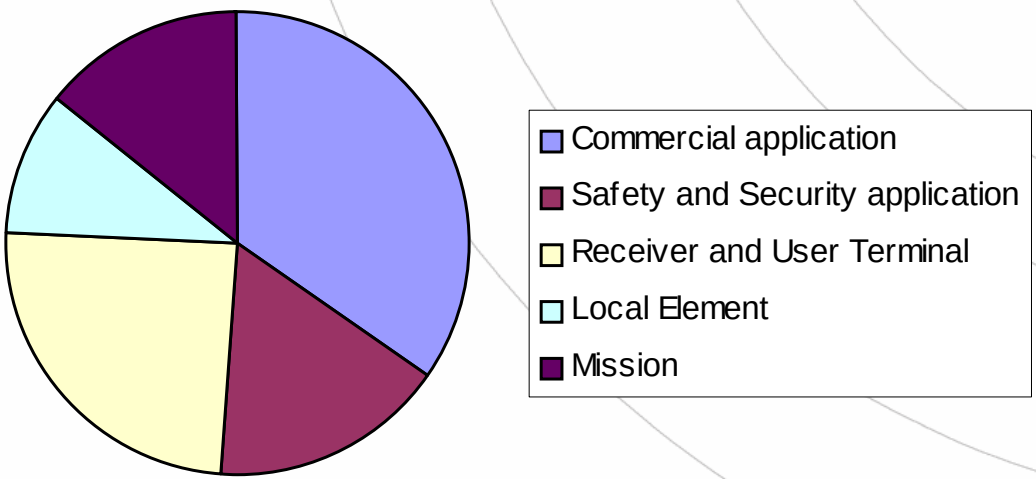
- *Galileo 2nd call have provided two platforms for SME involvement*
  - *Includes dedicated, sharply focused activities of smaller scope specifically targeted to SMEs*
  - *Special attention to the involvement of SMEs in the other R&D activities*
- *Provides activity context for innovation*
  - *Receivers, local elements, applications, prospective research*
- *Addresses technology development, demonstration and prospective studies*
- *Encourages technology transfer, innovative services and transnational co-operation and networking*

Innovation by SMEs

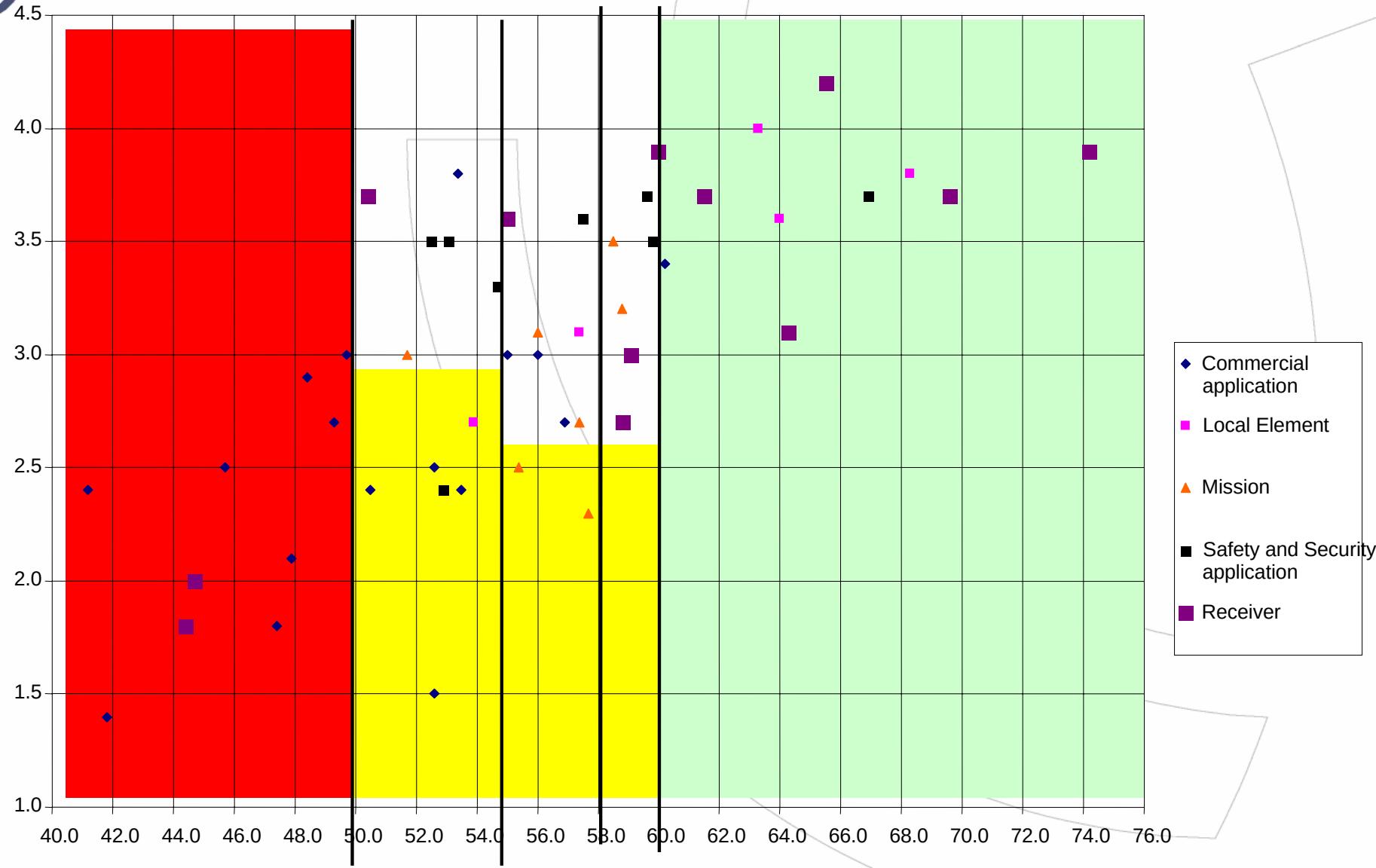
- *12-month projects*
- *Need to have innovative ideas at proposal stage and proceed with implementation*
- *Eligibility*
  - *2 companies from 2 Member States*
  - *SMEs defined under 1996 EC Recommendation*
    - *Annual turnover<40MEUR - Balance sheet total ≤27MEUR Size <250 employees – Independence <25% owned*
  - *Research labs/institutes*
- *Funding*
  - *300K€ GJU contribution as grant to the total (max 70% contribution for total project costs)*

Call SME – Submitted proposals

- *Among the 49 evaluated proposals:*
  - *17 are Commercial application oriented (35%)*
  - *8 are Safety/Security application oriented (16%)*
  - *12 cover Receiver or User Terminals (UT) aspects (24%)*
  - *5 focus on Local Elements (10%)*
  - *7 concern Mission aspects (14%)*



Call SME – Innovation vs. quality



Upcoming funding opportunities:

6FP 3rd Call

Galileo 6FP - 3rd call content

- ***Tracking and tracing:***
  - ***Support the development of applications in the "tracking and tracing" area in order to support the European initiatives and regulations in different domains:***
    - ***transport of animals,***
    - ***transport of fissile materials,***
    - ***borders control, coast guards,***
    - ***...***
  - ***considering in particular the Safety of Life Service and the Public Regulated Service***

- ***Additional Galileo Services:***
  - ***Assess the feasibility of potential additional services,***
    - ***design of an alarm system for major catastrophic events in specific geographical areas,***
    - ***the provision of "quality of service" information through authentication of the signal***
    - ***...***

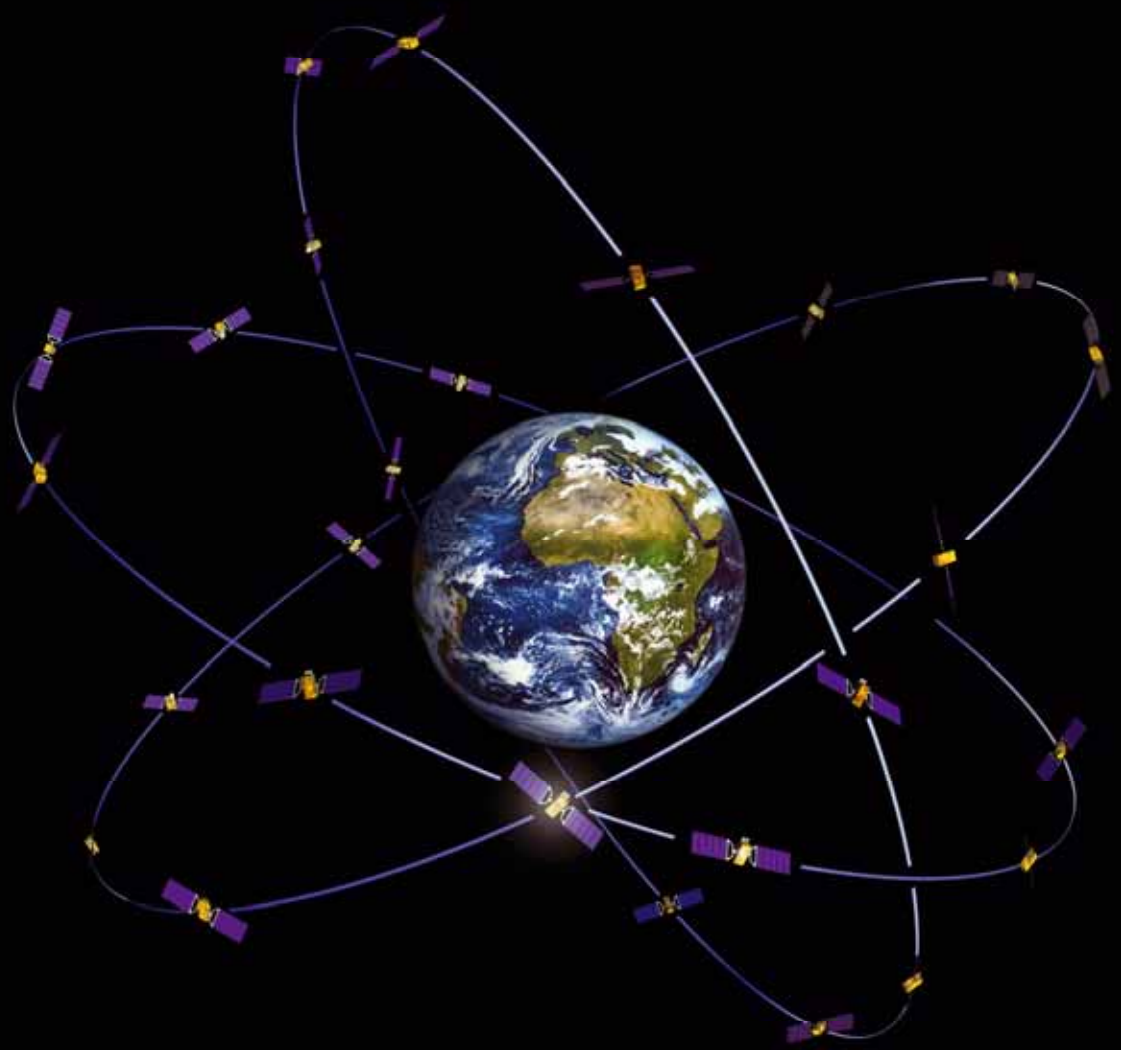
Galileo 6FP - 3rd call content

- *Other specific user communities*
  - *Develop GNSS applications and services in additional user community sectors such as*
    - *crisis management*
    - *time & synchronization*
    - *domestic use of Galileo*
  - *notably based on EGNOS services*
    - *taking into account the planned evolution of EGNOS, such as the new interfaces*
  - *and on the first Galileo signals available.*

- *Development of user equipments technology for all Galileo services*
  - *Receiver, local elements, test and simulation tools…*

- *Pursue the active support to SMEs and Research institutes with a view to expand the introduction of innovation.*

Thank you for your attention!



Stefano.Scarda@galileoju.com

www.galileoju.com

Market forecast

- *Market forecast indicates **2.5 billion** Galileo Users by 2020*
- *Galileo user community is foreseen to be dominated by mass market (for the 2020 about **90%** of the users will be related to **mobile phone integrated with GNSS receiver and Vehicle Telematics**)*
- *It is assumed that a **dual use Galileo/GPS** receiver will become the default by 2012 (for mass market use)*
- *Revenues are expected by both **Products and Services***
- *The Product related revenues will dominate the market until 2015 reaching a "saturation" while the Service related revenues will continue to grow*

GALILEO Market

- ***Major GNSS market segments short-term evolution (1)***

	2000	2006
In-vehicle navigation	***31%***	***41%***
Recreation	***16%***	
Asset tracking	***10%***	***16%***
Communication		***10%***

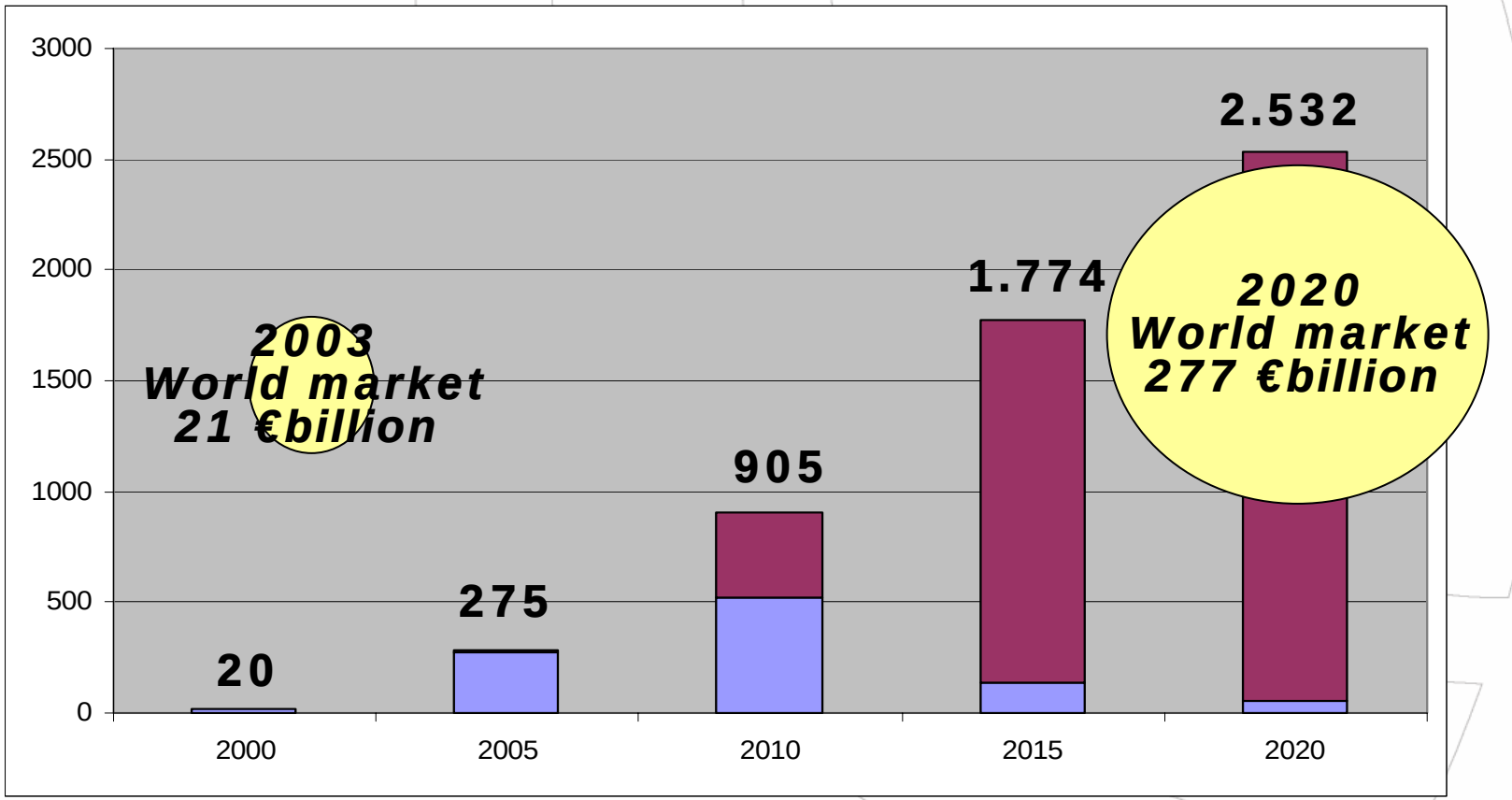
- ***Galileo Users for the main market segments (2)***

Application	2001	2005	2010	2015	2020
Personal mobility	0	0	308,419,725	1,381,212,160	1,991,169,570
Mass market vehicles	0	0	48,123,992	177,234,810	330,045,097
Commercial vehicles	0	0	16,351,109	59,376,920	114,261,090
Aviation	0	0	7,314	52,172	100,204
Rail	0	0	40,863	120,096	146,782
Maritime	0	0	575,519	1,383,903	1,902,230
Emergency services	0	0	2,372,151	5,998,685	9,795,553
Survey	0	0	215,912	396,853	473,220
Others	0	0	6,616,221	15,634,815	30,237,221
Totals	0	0	382,722,805	1,641,410,413	2,478,130,967

(1) Source: Allied Business Intelligence – GPS World Markets –2002
(2) Source: EC Galilei Study Market Observatory – ESYS – May 2003

GALILEO Users

- ***Number of GNSS users (Million) and GALILEO sharing***



Mobile phones world-wide GNSS market overview

- *Today*
  - *More than 1 billion of mobile phones in use in the world*
  - *About 200 million of new mobile phones (2003)*
  - *GNSS penetration about 8%*

- *Forecast for 2015 (1)*
  - *2.6 billion of mobile phones in use in the world*
  - *47 million of new mobile phones sold per year*
  - *GALILEO penetration: about 52%*
  - *Cumulated number of mobile phones sold in the 10 years period 2010-2020: 8.100 million*

(1) Source: GALILEI study 2003

Cars world-wide GNSS market overview

- *Today*
  - *More than 500 million of cars in use in the world*
  - *About 14 million new cars in 2003*
  - *GNSS penetration about 2% (50% in Japan, 10% in EU and USA)*

- *Forecast for 2015 (1)*
  - *More than 700 million of cars in use in the world*
  - *GALILEO penetration about 30%*

(1) Source: GALILEI study 2003

GALILEO Market data

- *GNSS market figures coming from different studies/reports:*
  - *World GPS systems market growth (1)*

	2000	2006
$billion	*10*	*34-41*

  - *GNSS world market (2)*

	2003	2020
€billion	*21*	*277*

  - *User numbers, in million (2)*

	2001	2005	2010	2015	2020
GNSS	*21 285*	-	*1774*	*2532*	
GALILEO		*382*	*1641*	*2478*	

  - *Benefits of GALILEO in Europe, million € (2)*

	2010	2015	2020
User benefits	*1.900*	*6.746*	*13.964*
Indirect benefits	*706*	*2.254*	*3.184*
Social benefits	*292*	*1.135*	*2.093*

(1) Source: Allied Business Intelligence – GPS World Markets –2002
(2) Source: EC Galilei Study Market Observatory – ESYS – May 2003