

GNSS. asia

GNSS trends and industrial cooperation opportunities

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GNSS.asia Coordinator

GNSS.asia focuses on industrial GNSS cooperation in downstream applications and receivers

GNSS.asia objectives

Define **industrial cooperation strategy**
between EU and 5 Asian economies

Support concrete **collaboration opportunities**
between companies

Raise awareness on Galileo and EGNOS in Asia.
Ensure Galileo is in chipsets/receivers

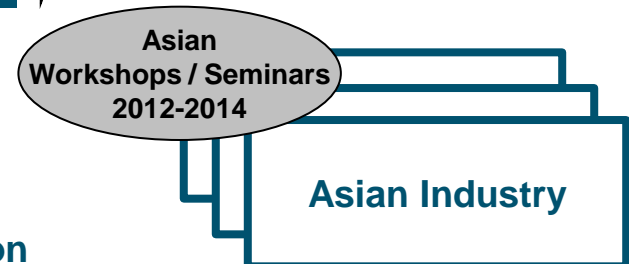
GNSS.asia project facilitates industrial cooperation



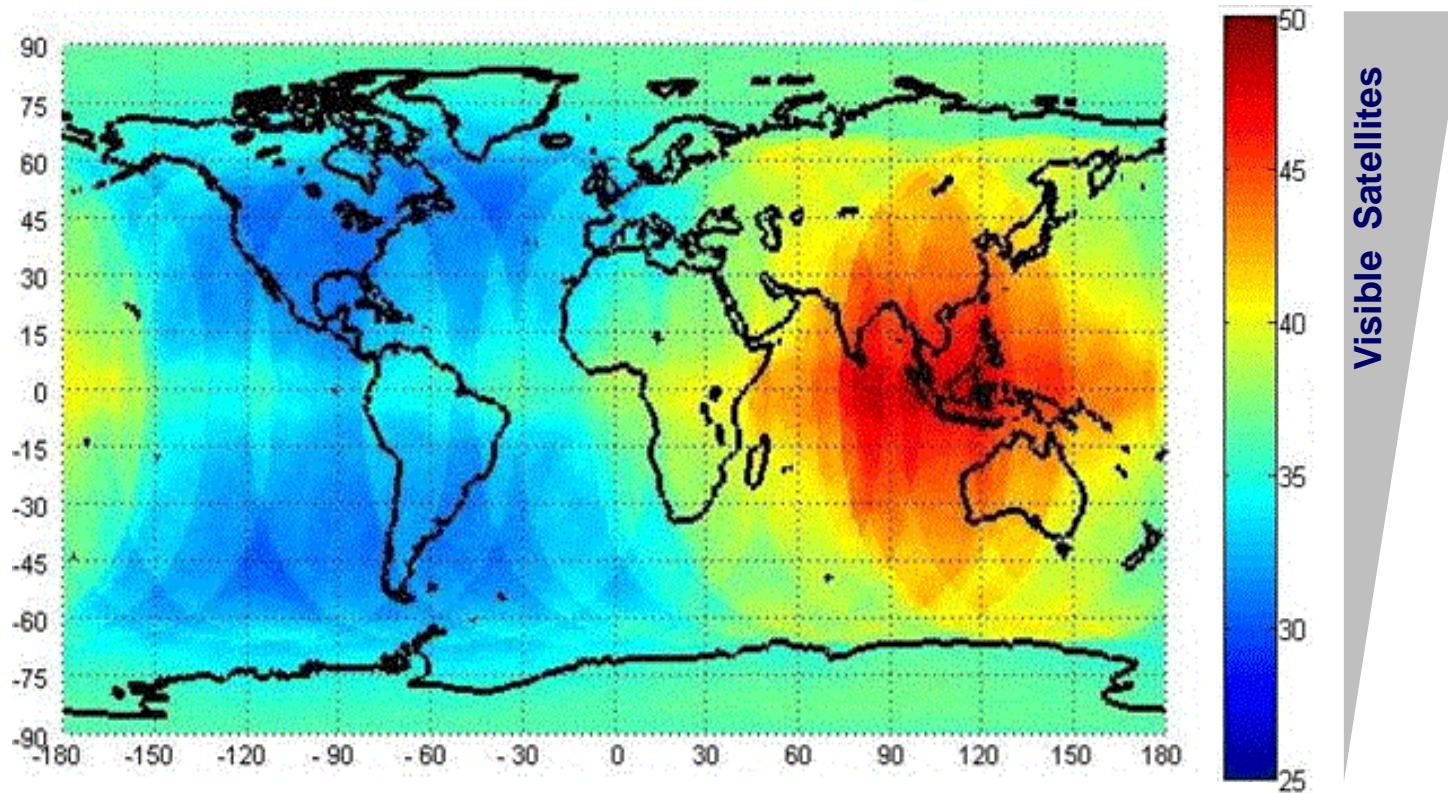
- Define strategy on GNSS industrial cooperation (applications and receivers)



- Identify and engage key stakeholders
- Map local GNSS Industry
- Raise Galileo awareness

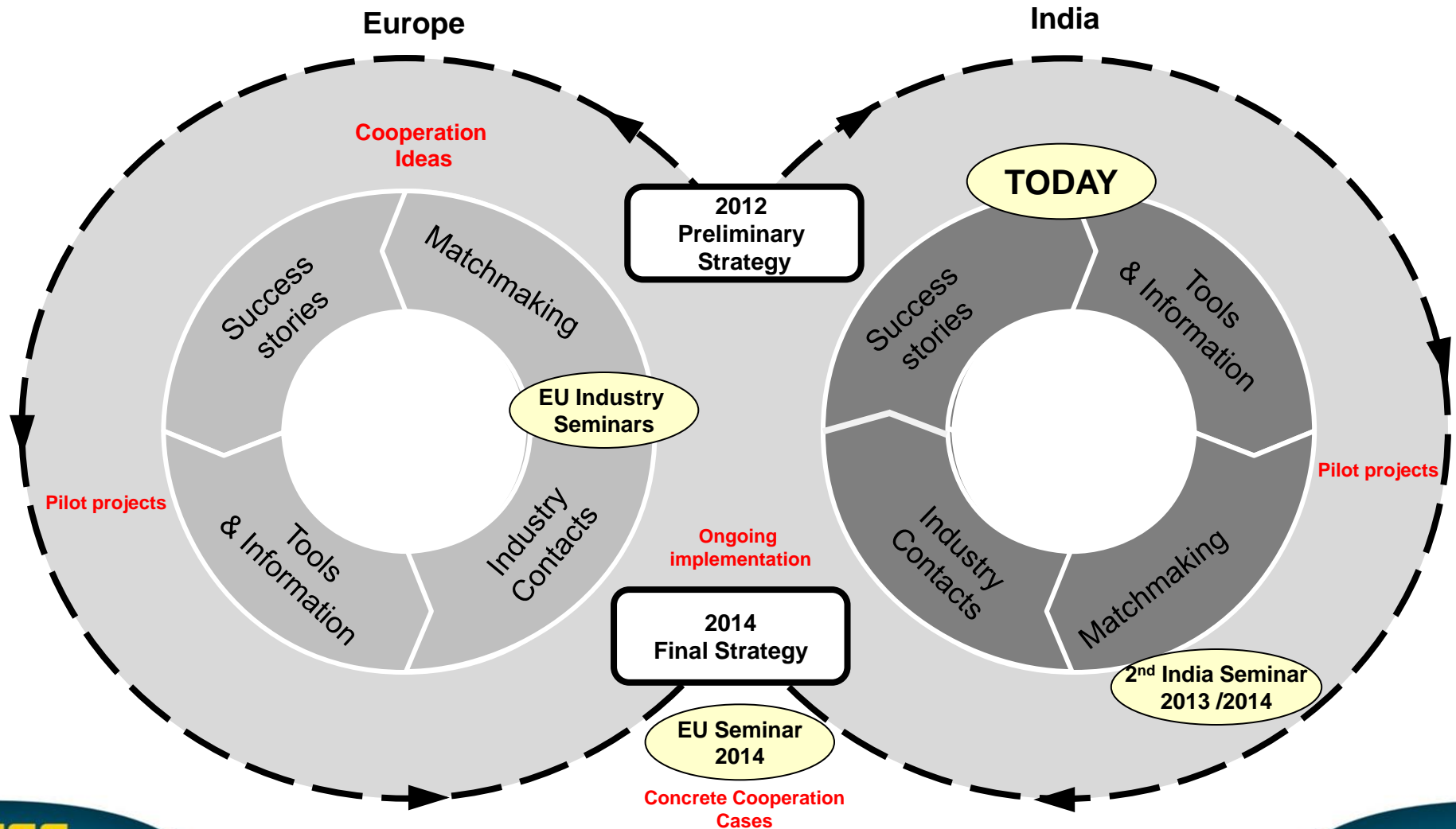


Why GNSS.asia? Asia is the Multi-GNSS hotspot



Source: University of New South Wales (Dempster & Rizos, 2009)

The GNSS.asia Industrial Partnering Scheme



The European GNSS Programmes: EGNOS and Galileo



- Europe's Civil Global Navigation Satellite Systems (GNSS)
- Fully compatible with GPS
- Early services starting from 2014
- Open service free of charge
- Delivering dual frequencies (better performances)



- Europe's Satellite Based Augmentation System (SBAS)
- Measures and improves GPS performance
- Sends corrections to users via satellite or terrestrial links (EDAS)
- Covers Europe (extension to Africa in preparation)

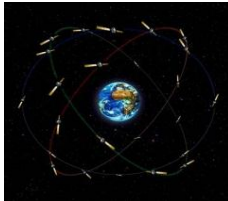
Galileo Implementation Plan

Galileo is implemented
in a step-wise approach

Full Operational Capability
Full services, 30 satellites

Initial Operational Capability
Early services for OS, SAR, PRS,
and demonstrator for CS

2014

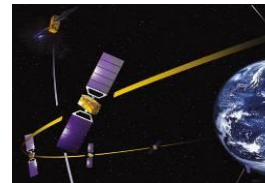


In-Orbit Validation
4 fully operational satellites and
ground segment

2013

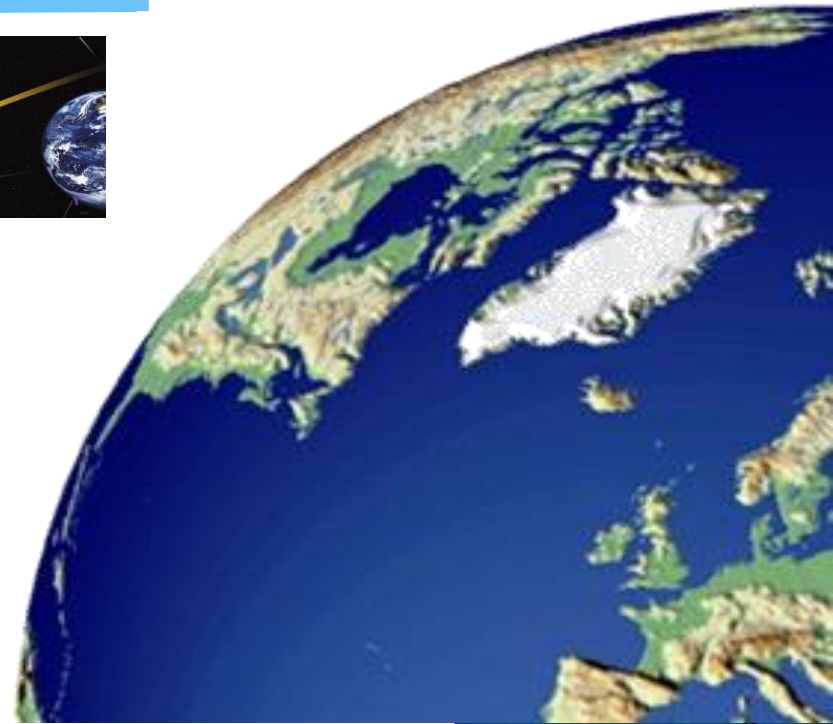


GIOVE A/B
2 test satellites
2005/2008



Galileo System Testbed v1
Validation of critical algorithms

2003



Galileo will provide added value for Industry

- Galileo is the only GNSS under civil control
- Civilian dimension of Galileo enables involvement of industry in the downstream sector
- Interoperable with other GNSS systems for higher precision
- Higher accuracy than competing systems in high-rise cities, where buildings obscure signals from today's satellites
- Commercial Service offers authentication of the signals and even higher accuracy – Enabler for many applications (in specialised markets too)
- Search and Rescue Service assists in locating people in distress and confirms that help is on the way (only Galileo offers this two-way signal service)

India can benefit from both European Systems



European R&D and
know-how

'It's there, use it with
GAGAN in India'



Global Navigation
powered by Europe



'embrace it for Global
products and
services'

European Companies are eager to work with Asia in GNSS

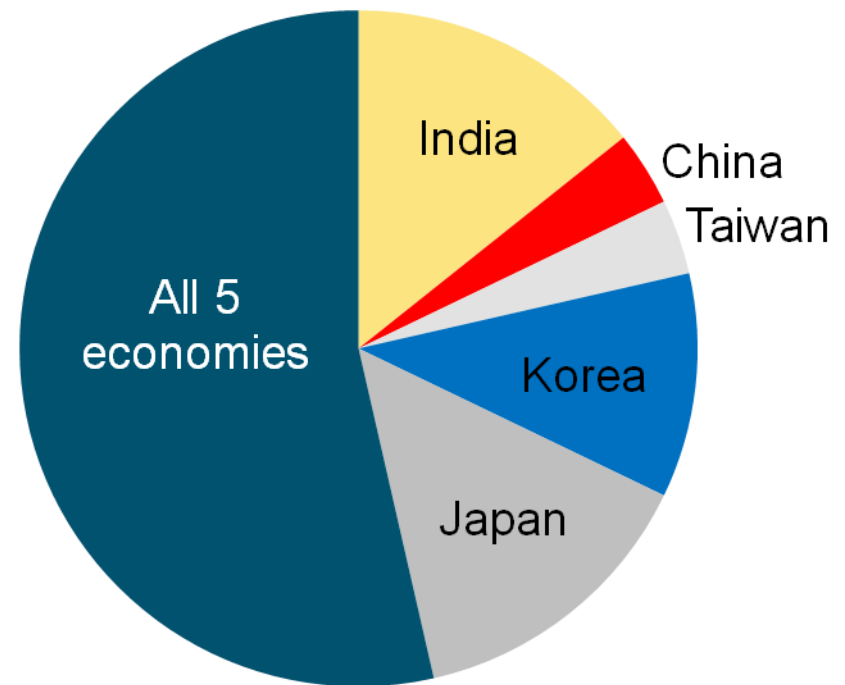
“We want to cooperate on multi-constellation receivers”

“We are looking to expand our indoor navigation solutions business with shopping malls in any of the Asian markets”

“We are looking for partnering opportunities in all 5 countries”

“We have worked with ... but would like to expand our business within the wider region”

Most interested in ...



Several companies are interested in India - many are present today

Aviation



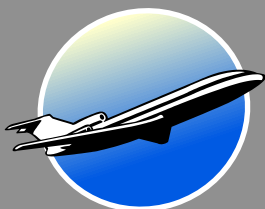
Receiver / Chipset



Applications / Software / System Integrators / Solution Providers



Examples of current GNSS applications in Europe



Aviation:

- Approaches with vertical guidance (SBAS APV)
- Advances procedures for approach and landing

Road:

- Navigation
- Road tolling
- eCall
- ITS
- Logistics
- ADAS

Maritime:

- Entering ports
- Coastal navigation
- Open sea navigation
- Inland waterways navigation

Agriculture:

- Tractor guidance
- Automatic steering
- VRT
- Asset monitoring

Surveying:

- Cadastral surveying
- Construction surveying
- Mapping

LBS:

- Location based applications
- Weather info, gaming, social media, advertising
- Personal navigation

GNSS.asia and industry partners have identified four areas of cooperation

- 1. Civil Aviation (EGNOS-GAGAN)**
- 2. Road and infrastructure**
- 3. LBS**
- 4. Receivers and chipsets**

The complementarity between EGNOS and GAGAN allows for cooperation in the aviation space



Rationale

- GAGAN-EGNOS technical complementarity provides immense opportunity for EU-India
- EU-India civil aviation co-operation agreement is alive and ready to go

Key opportunities

- Development and manufacturing Multi GNSS receiver (including GAGAN signals)
- Training programs for Indian experts in EGNOS implementation & certification processes
- Near-aviation applications:
 - Airport Ground Movements
 - Anti-Collision
 - Intermodal Asset Tracking

There is significant untapped potential in road and infrastructure sectors



Rationale

- Passenger and commercial vehicles growth
- Indian government plans to adopt GNSS in traffic management, railways

Key opportunities

- Traffic Information & Tolling
- Intelligent fleet management
- Train Tracking & Passenger information system
- Advancement of Indoor Navigation systems
- Virtual Boundaries
- Metro, Airports, Roadways, Power Plants, Dams
- Supply Chain in Retail sector

GNSS growth in LBS sector depends on specific key enablers



Rationale

- Mobile phone sector growth by 10%
- Mobile phone sector depends on LBS through base stations rather than GNSS
- Only high-end phones have GPS (1% penetration)

Key opportunities

- Introduction of GNSS receivers
 - terminal level
 - system synchronization process
- Development of GPS/Galileo receiver
- Joint R&D in new area of satellite signal usages like in [EGNOS Data Access Services \(A-GNSS\)](#) for LBS services.

Low cost receivers and chipsets in a Multi-GNSS context



Rationale
<ul style="list-style-type: none">▪ Multi-GNSS era (Asia hotspot)▪ EGNOS – GAGAN complementarity
Key opportunities
<ul style="list-style-type: none">• Development of GAGAN receivers for non-aviation• Multi-GNSS receiver developed, produced and serviced in India in JV with European companies• Sensor-Fusion, Multi GNSS integration• Low cost chipsets and receivers

European Industrial R&D – a key starting point for collaboration

FP7 Research Areas

Road	LBS
Rail	Maritime
Aviation	High Precision
Agriculture	Receivers

- ~ € 65 MN spent in FP7 since 2007
- Total 85 Projects, 37 still running
- 100 companies and institutions
- Around 50% on EGNOS specifically
- Many R&D projects also my national funding

R&D Info & Results: www.gsa.europa.eu



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News

Opportunity For Success

As EGNOS coverage extends south and east, new markets for GNSS technologies developed in Europe are opening up. The European Commission has funded a comprehensive survey that not only identifies the main market potential for EGNOS applications in these territories but also identifies the areas that could satisfy demand.



European Space Expo

Spanish citizens will be able to experience the latest technology and applications of space technology at the European Space Expo. The free exhibition shows you how space tech is making a difference in your life.



EGNOS Proves Its Value In Maritime And Inland Waterways

A new report demonstrates that EGNOS can deliver the performance required for safe navigation in maritime and inland waterways. The report is based on results from comprehensive testing of the EGNOS service around a variety of ports across Europe. Implementing EGNOS for waterborne navigation can complement existing systems and provide additional benefits.



Highlights

- › [GSA Releases 2012 GNSS Market Report](#)
- › [New 'Farming By Satellite' Prize Awards Tech Savvy Students And Young Farmers](#)

GNSS News Connect

EGNOS Plus Galileo Will Equal Even Safer Skies

Europe's two satellite navigation systems could combine in a new way to provide a more secure and reliable service for heightened...

Russia And India Join Global Satnav Augmentation Network

Experts ensuring that aircraft can safely rely on satellite navigation across Europe and...

› [Galileo's Search And Rescue System Passes First Space Test](#)

The first switch-on of a Galileo search and rescue package shows it to be working well...

› [Making The Galileo Connection](#)

On a humid afternoon in French Guiana, a small team of Spanish engineers watched as the...

- **FP6 & FP7 Project Portfolio**
- **Search FP6 & FP7 databases (call, keyword, country)**
- **On-line 'Virtual Library' reach approx 500 docs from projects**

EGNOS success in Europe - Opportunities in India

EGNOS applications / R&D Projects which could be explored in India :

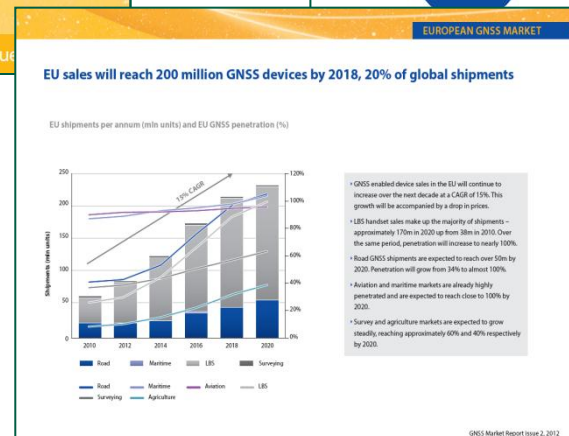
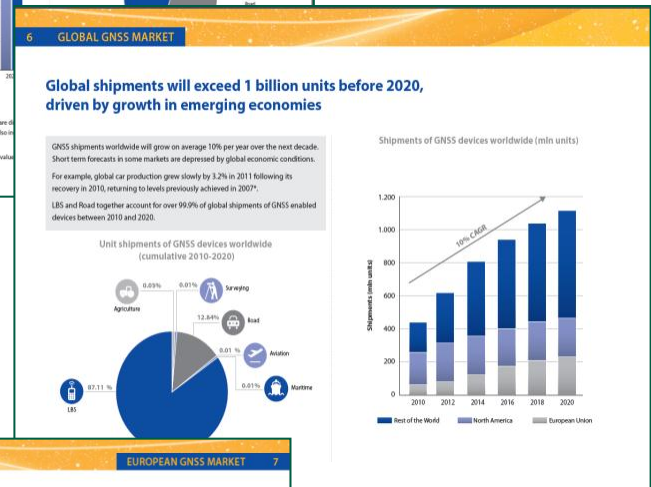


GNSS market research is freely available from from the European GNSS Agency (GSA)



SECTORS COVERED:

- Aviation
- Agriculture
- Road transport
- LBS
- Surveying
- Maritime (open sea)



<http://www.gsa.europa.eu/node/2923>



Thank You



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THANK YOU

.. any questions?

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