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EUROPEAN COMMISSION

Brussels, 14.6.2010
COM(2010)308 final

**COMMUNICATION FROM THE COMMISSION TO THE COUNCIL, THE
EUROPEAN PARLIAMENT, THE EUROPEAN ECONOMIC AND SOCIAL
COMMITTEE AND THE COMMITTEE OF THE REGIONS**

Action Plan on Global Navigation Satellite System (GNSS) Applications

SEC(2010)716
SEC(2010)717

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Action Plan on Global Navigation Satellite System (GNSS) Applications

1. INTRODUCTION: TOWARDS MORE APPLICATIONS OF EGNOS AND GALILEO IN EUROPE

1.1. EGNOS is there, let's use it!

EGNOS¹, the European satellite-based augmentation system that paves the way for GALILEO, has been in service since 1 October 2009. Six months before, on behalf of the EU, the Commission took over from the European Space Agency (ESA) ownership of the system. With its three geostationary satellites and 40 ground stations spread over Europe and North Africa, EGNOS supplements the Global Positioning System (GPS), to which the US provided access for civilian use, with no guarantee of service, back in 2000.

The European Green Paper consultation on GNSS applications of 2006 confirmed the wide range of potential GNSS application domains in Europe making use of the positioning, velocity and timing capabilities offered by GNSS.

EGNOS offers free enhanced satellite navigation signals over Europe which are ten times more precise than GPS. All application domains which use positioning and velocity information can benefit from this improved accuracy: all transport modes through the management of infrastructure and the provision of geo-localised information, logistics, precision agriculture, civil protection and emergency management, mapping and land registry, fisheries, energy, management of natural resources, mining, Earth sciences, meteorology, the modelling of climate change, environment, justice and law enforcement, border control, etc.

Another advantage EGNOS can offer civilian users is integrity, i.e. a measure of the trust which can be placed in the correctness of the information supplied by the system, with the user being automatically alerted whenever an error made by the system is beyond a certain confidence limit. Integrity plays an important role in Safety of Life applications in transport (all modes of transport, airport management, automatic vehicles), sensitive commercial applications (high-precision oil platform location, logistics, transport of dangerous goods), or liability-critical applications needing legal recourse (reconstruction of road accidents, road user charging, synchronisation of electrical or telecommunication networks).

1.2. Europe must take its share of the global GNSS downstream market

Together with the GPS signal, EGNOS today, and later GALILEO, strengthens the infrastructure leading to a global market for GNSS products and services, called downstream GNSS applications. In 2008, this was worth €124 bn.

¹ EGNOS: European Geostationary Navigation Overlay Service

The market is founded primarily on basic positioning and timing signals, but is expected to benefit from the planned introduction of authentication and encryption of signals. Experts predict that, in volume, 75 % (52% in revenues) of this market will come from products and services linked to mobile telecommunications and personal handsets, with a further 20 % (44% in revenues) from intelligent transport systems for road and the remaining 5 % (4% in revenues) from other domains of application.

Despite Europe's investment in its GNSS infrastructure and the availability of EGNOS, European industry has only a low share of the global GNSS applications market compared with what it is capable of achieving in other sectors of high-technology (a good third). This is a problem since:

- Applications based on EGNOS and subsequently on GALILEO would make a decisive contribution to the development of a knowledge-based society and the creation of high-value jobs in the EU. Europe will therefore be missing a huge opportunity if it does not take an appropriate share of the economic benefit expected from GNSS applications. Also, if GALILEO and EGNOS do not become the underlying GNSS standard in Europe, many application domains may remain shackled with technologies which prevent them from benefiting from the added-value of new advanced services.
- The limited use of applications based on EGNOS and GALILEO leads to critical dependencies as GNSS are very pervasive, providing vital position, navigation, and timing information for a whole range of daily-life activities and for Europe's security and social and economic development. By relying only on GPS-based applications, the EU would be exposed to the potential non-availability of the GPS signal, which is beyond the EU's control since its primary objective is to support the military operations of a third country.

In the same way as the Internet, the pervasiveness of GNSS services is huge. The most recent and conservative estimates of the overall benefits of EU GNSS programmes to EU industry, citizens and Member States are put at between €55 and €63 bn over the next 20 years, with most important benefits arising from indirect revenues in the downstream industry (between €37 bn and €45 bn). As a consequence, the low uptake of applications based on EU GNSS is a problem that affects European society in general, and in many ways².

Meanwhile, uncertainty surrounding the European GNSS has been affecting confidence in potential downstream business. Growing 'competition' from third countries (US, Russia, China, India, Japan, which have recognised the strategic value of GNSS and declared their intention of deploying GNSS capabilities for civilian use, including the development by their industry of applications based on their own system) has also changed the context for the development of GNSS applications to the detriment of European players, as these systems could enter into operation at about the same time as GALILEO.

So given the new reality of EU GNSS programmes, a detailed action plan is called for: to boost people's confidence in the programmes, to foster the development of EGNOS and GALILEO downstream applications, and to achieve the quickest, deepest, broadest

² The issue of the direct income potentially generated by the European GNSS will not be addressed in this Communication; nor will actions specifically related to the Public Regulated Service (PRS), for which the access is restricted to the authorities of the Member States. Both issues will be addressed in separate documents.

development of applications across all domains so to reap maximum benefit from the EU's infrastructure.

2. WHAT ROLE FOR THE EU?

The potential benefit of GNSS applications spans several policy fields which are coordinated at EU level, including the EU2020 strategy and its EU flagship initiative 'An industrial policy for the globalisation era', transport safety, the environment, and Common Agriculture Policy enforcement. And since the adoption of EU GNSS often requires compliance with international norms or certification at European level, EU action is needed to avoid duplication and wasted effort at Member State level.

Maintaining the status quo and taking no EU action would result in fragmented or uncoordinated action by Member States and would maintain the current low level of applications uptake based on EU GNSS, limit the effectiveness of novel applications, create barriers to the free movement of goods and services, and bring about unequal treatment for European citizens.

Because the Commission is managing GALILEO and EGNOS on behalf of the EU, it has to ensure the best return on investment on these programmes. Also, the Commission will mobilise R&D funds stemming from EU research programmes...

Proposals for EU action have therefore been collected through an extensive consultation exercise, starting with the above-mentioned 2006 Green Paper on the applications of satellite navigation. Several market studies and cost-benefit analyses have been conducted by the Commission and other European stakeholders, including some Member States. Also, new ideas have been triggered through calls for research proposals under the European Union 6th and 7th Framework Programmes for R&D or calls for ideas, such as the 'GALILEO Masters'.

The number of domains where applications can be developed is huge, but budget constraints mean that Commission action needs to be focused on a limited number of topics where its influence is greatest. Other avenues of approach are left to other players and to market forces. In addition to these priority domains, the Commission proposes to enhance innovation across domains with 'horizontal' action to improve EU GNSS pervasiveness more generally.

3. A PROGRAMME OF ACTION IN SPECIFIC PRIORITY DOMAINS

Of the possible application domains spelled out above, priority has been given to domains where GNSS applications can do most in terms of:

- contribution to EU objectives (growth, jobs, knowledge society);
- indirect economic (including energy consumption) and social benefits;
- positive influence on emissions and other types of pollution;
- positive influence on the operation of the single market and cross-border trade;
- positive influence on the interoperability of applications;
- linkage with interests arising from consultations and calls for ideas and business cases;

- influence of European Commission and Member States' authorities;
- timing constraints and opportunities (with EGNOS available now, GALILEO In-Orbit Validation (IOV) soon, GALILEO Full Operational Capability (FOC) only later);
- specific added-value arising from the competitive advantages of EGNOS and GALILEO services: authentication, integrity, high accuracy for positioning, navigation and timing.

This process has led to focusing the action plan, for the period up to 2013³, on the domains that are shaded darker (cf. figure 1): applications for individual handsets and mobile phones; road transport; aviation; maritime transport and fisheries; precision agriculture and environment protection; civil protection and surveillance.

³ The European Commission will continue to monitor the market, and to assess the impact of action with a view to adapting priority domains whenever the action plan is updated.

| | Aviation | Maritime transport | Road transport | Urban transport | Rail | Logistics | Fishing | Precision agriculture and environment | Meteorology and disaster prevention | Synchronisation of networks | Mapping and land management | Energy | Civil protection and surveillance | Handsets and mobile phones |
|---|----------|--------------------|----------------|-----------------|------|-----------|---------|---------------------------------------|-------------------------------------|-----------------------------|-----------------------------|--------|-----------------------------------|----------------------------|
| EU objectives | ++ | ++ | ++ | + | + | ++ | ++ | +++ | + | + | ++ | + | + | +++ |
| Maximisation of indirect economic and social benefits | ssr | sss | ssrr | sr | srr | rrs | ssr | rrhh | sss | rs | rr | ssr | sss | rrr |
| Impact on emissions and pollution | ++ | ++ | +++ | ++ | = | + | + | +++ | + | = | = | + | + | = |
| Impact on the single market and cross-border trade | + | + | +++ | + | ++ | ++ | + | = | = | +++ | + | ++ | ++ | + |
| Impact on interoperability of applications | ++ | ++ | +++ | + | ++ | + | = | = | ++ | +++ | + | ++ | +++ | +++ |
| Manifestation of interest | ++ | ++ | +++ | ++ | + | + | ++ | +++ | + | ++ | + | + | ++ | ++ |
| Influence of public authorities | +++ | +++ | +++ | +++ | +++ | + | ++ | ++ | +++ | ++ | +++ | ++ | +++ | ++ |
| Timing priority (urgent:+++ , timely:++ , with Galileo:+ , not urgent: -) | +++ | ++ | +++ | + | ++ | ++ | + | +++ | + | - | ++ | ++ | + | +++ |
| Specific value added by EGNOS or Galileo | +++ | +++ | +++ | ++ | + | ++ | +++ | ++ | + | +++ | ++ | + | ++ | ++ |

Figure 1: Prioritization scheme for GNSS segments

In each domain, priority is given to actions seen as most cost-effective, or are most affected by the availability of EGNOS, and where the European Commission is best equipped to act (applying the principle of subsidiarity).

Instruments will be selected from among those traditionally in the hands of the Commission: especially coordination between authorities, information dissemination, awareness raising, and possibly regulatory measures — subject to specific impact assessments — where market forces are not deemed sufficient.

3.1. Certification, standardisation and coordination activities

Aviation is by design the first application domain of EGNOS. The ‘Safety of Life’ service of EGNOS has been designed with the needs of the aviation sector in mind. Potential users of GNSS include not only large international airlines, but also operators of general aviation aircraft and helicopters. Airports may also be interested in European GNSS services for the management of ground traffic. R&D projects have shown that small, not fully equipped airports can substantially improve and increase traffic by using GNSS rather than installing currently used expensive ground equipment. .

The Single Sky policy and the Single European Sky ATM⁴ Research (SESAR) strategy also build on European GNSS. It is thus of paramount importance to get EGNOS certified for use by civil aviation.

Action 1: Certification of EGNOS is being sought for civil aviation (through the European Aviation Safety Agency (EASA) and according to International Civil Aviation Organization (ICAO) standards), which involves certifying the system and its operator.

The uptake of EGNOS in Europe, of Wide Area Augmentation System (WAAS) in the USA, and of other Satellite-Based Augmentation Systems (SBAS) in the Far East will provide continuity of service to SBAS-equipped aircraft from America to Asia. EGNOS currently covers Western and Central Europe. It will be extended eastwards and southwards in the Mediterranean area. Similar systems over Africa will facilitate connections between Europe and this continent. The existing EGNOS satellite segment could be part of the solution.

Action 2: The European Commission will pursue preparatory work on providing the Middle East and Eastern and Northern Europe with SBAS coverage on a par with the level of performance offered by EGNOS in the EU. It will propose scenarios to the forthcoming EU-Africa Summit for establishing SBAS in Africa.

By far the leading market by size (75% of the GNSS world market for products and services), the telecommunication market requires little investment for developing most applications, once cheap receivers are widely available (e.g. by mobile-phone manufacturers).

Action 3: The European Commission will promote GALILEO and EGNOS enabled chips and handsets through industrial cooperation with GNSS-owner countries and with receiver manufacturers.

⁴ ATM: Air Traffic Management

Some future Intelligent Transport Systems (ITS) applications for road transport, including Advanced Driver Assistance Systems (ADAS), will be based on the integrity and authentication functions offered by GALILEO. This will require the establishment of a certification body and certification procedures to be elaborated in cooperation with vehicle manufacturers, electronics suppliers and road service operators.

Action 4: The certification of GALILEO for ADAS will be investigated.

Maritime transport monitoring and surveillance would be greatly improved by EGNOS and GALILEO applications for navigation, including in ports, coastal areas or dangerous shipping lanes like the English Channel. GNSS is also a key tool for new European traffic monitoring systems (LRIT — Long Range Identification and Tracking). Used in mountains and desert areas too, the GALILEO Search and Rescue (SAR) service is being designed specifically for the safety of fishermen and sailors. By making it easier to track ships, GALILEO can also facilitate customs procedures. Another application is on inland waterways where GNSS, with its improved accuracy, should be an important source of data for the River Information Services (RIS). For all such safety-critical applications certification is required.

Action 5: Adoption of EGNOS, then GALILEO, will be sought for maritime transport in cooperation with the International Maritime Organization (IMO), taking into account International Conventions such as the International Convention for the Safety of Life at Sea (SOLAS).

Action 6: Acceptance of GALILEO SAR capabilities by the Cospas-Sarsat organisation.

3.2. Information dissemination, information exchange, and awareness-raising campaigns

Road transport is the second GNSS market by size (around 20% of the world market for GNSS products and services). ITS for road transport can make greater use of GNSS services. For instance, the use of GNSS is already recommended by the European Directive on interoperability of electronic fee collection systems⁵, or by the Regulation on transport conditions of living animals⁶. The European Commission ITS Action Plan⁷ and its accompanying directive⁸ addresses the promotion of GNSS services within specific ITS applications (eCall, tolling, parking for trucks, etc.). The Logistics Action Plan⁹ is another opportunity to develop GNSS applications for real-time tracking of containers, or to prevent theft. There is, however, very little awareness of EGNOS in the ITS community.

Action 7: The European Commission will undertake an awareness campaign including a series of tests to demonstrate the benefits of EGNOS and a marketing campaign targeting the road transport community.

⁵ Directive 2004/52/EC of 29 April 2004 on the interoperability of electronic road toll systems in the Community.

⁶ Council Regulation (EC) No 1/2005 of 22 December 2004 on the protection of animals during transport and related operations and amending Directives 64/432/EEC and 93/119/EC and Regulation (EC) No 1255/97.

⁷ COM(2008) 886.

⁸ COM(2008) 887.

⁹ COM(2007) 607.

Following the certification of EGNOS for aviation, awareness will need to be raised among the actors in civil and general aviation, including aircraft manufacturers and airport authorities, about the availability of the services.

Action 8: In conjunction with Eurocontrol, the European Commission will engage in an awareness and market development campaign focusing on aircraft manufacturers, general aviation and small airports.

Likewise, awareness of the new services provided by EGNOS, and then GALILEO, for maritime activities needs to be raised among equipment manufacturers, shipbuilders, port authorities and ship owners (fisheries, leisure vessels, merchant ships).

Action 9: The European Commission will engage in an awareness campaign targeting equipment manufacturers and shipbuilders, port authorities and ship owners.

EGNOS is already used by some European farmers. Its accuracy and reliability help them save them time, fuel, water and chemicals. Beyond agriculture, GNSS can help protect the environment and manage natural resources, as it constitutes an indispensable source of data, in conjunction with other sources of measurement such as the Global Monitoring for Environment and Security initiative (GMES). The main issue in that domain is to raise the awareness of potential users for the benefits provided by GNSS.

Action 10: The European Commission will undertake an awareness campaign targeting agriculture and other natural resource management activities.

Together with GMES, the added-value services of GALILEO will help in the management of humanitarian disasters, in tackling forest fires, and in rescuing endangered persons. They will be crucial for security, helping with the monitoring of borders and the surveillance of maritime zones.

Action 11: The European Commission will seek to raise awareness and coordinate Member States' activities related to civil protection.

3.3. Regulatory measures

Some regulatory measures may become necessary where GNSS adds value for road safety (e.g. monitoring the transport of dangerous goods, or for long-range public transport), for the efficiency of freight transport, or for improved traffic management, as a complement to the Logistics and the ITS Action Plans, and more specifically to its actions 3.2 ('eCall') and 4.1 (as regards an open in-vehicle platform). There will be specific impact assessments to this end.

Action 12: The European Commission will investigate the expediency of some Directives: One on GNSS-based monitoring of long-range coaches, and one on GNSS-based multimodal logistics. As regards GNSS-based monitoring of the transport of dangerous goods, the European Commission will examine various options concerning the use of telematics jointly developed at the international level (e.g. UNECE¹⁰ and OTIF¹¹).

¹⁰ UNECE : United Nations Economic Commission for Europe

Action 13: The European Commission will investigate the expediency of amending the Regulation bearing on digital tachographs, notably to take advantage of the availability of authenticated GNSS-based positioning, timing and speed information.

Some future actions in the ITS area for road transport (including ADAS, anti-theft protection, accident data recorders and reconstruction systems) will require transmission of the electronic identification and the location of vehicles.

Action 14: The European Commission will investigate the expediency of a Directive on equipping vehicles with a GNSS and Radio Frequency Identification (RFID) enabled on-board functional unit to provide both the exact authenticated position and the electronic identification of the vehicle, taking duly into account privacy and data protection rules.

A Common Agriculture Policy addressing environmental factors is boosting the need for details of the precise location of objects and stock.

Action 15: The European Commission will seek to introduce the use of EGNOS and GALILEO in the management and control systems of EU programmes (e.g. the Common Agriculture Policy.)

4. HORIZONTAL ACTIONS

The second action group includes ‘horizontal’ activities aimed at developing a wide range of applications in a variety of domains, and at enhancing innovation, including unexpected, ‘bottom-up’ ways of using GNSS services — as happened with the Internet.

For instance, new applications for individual handsets and mobile phones are expected to flourish ‘bottom-up’, subject to the widescale availability of cheap receivers.

Action 16: The European Commission will fund R&D activities aimed at reducing the cost of receivers, underpinning Action 3.

GNSS provide a new and simple means of establishing the precise position of fixed points. They can help to build up an accurate data base of digital maps, and are obviously useful in terms of the very many application domains that build upon geographical information systems, starting with databases for cartography, technical maps, or the creation and/or updating of land-use registers. In this regard, data collection should comply with existing Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)¹² and its implementing rules.

Action 17: The European Commission will promote the use of EGNOS and GALILEO in surveying in the Member States and third countries. The capabilities of EGNOS and GALILEO for improving the update of geographical databases will be explored by such means as exchanges of best practice and coordination among Member States.

¹¹ OTIF : Intergovernmental Organisation for International Carriage by Rail

¹² OJ L 108, 25.4.2007, p. 1–14

Many GNSS applications need to combine Earth-observation-related services such as the GMES core services, and telecommunication services.

Action 18: The European Commission will work towards boosting the synergy between GALILEO, GMES, GEOSS¹³ and telecommunication programmes it manages, with a view to enhancing combined services.

For applications to flourish in the widest possible range of domains, GNSS technical specifications, legal and economical information must be made available to users and application developers worldwide. Users must be able to share experience and practice, and developers provided with a tool-kit that facilitates their work.

Action 19: The European Commission will establish an International EGNOS and GALILEO Application Forum where users, developers, infrastructure managers and systems providers can exchange views to feed into the Europe GNSS evolution project.

Action 20: The European Commission will establish and maintain a virtual information centre and a general awareness and communication campaign. This will also serve to gathering feedback, to feed into the specifications for evolutions of EGNOS and GALILEO.

Small and medium-sized enterprises and businesses (SMEs) are the key players, and the most likely to generate employment in innovative sectors. They must be made aware of the new potential offered by EGNOS and GALILEO so that they engage into research. SMEs also must be helped in accessing finance when making the shift from research to prototypes and products.

Action 21: The European Commission will increase awareness among SMEs through two instruments of the Entrepreneurship and Innovation Programme (EIP): dedicated action by the ‘Enterprise Europe Network’, and the GNSS-innovation voucher scheme under ‘Innovation Partnership for Satellite-enabled Services’.

Action 22: The European Commission will seek synergies between investment programmes run by the European Investment Bank on behalf of the European Union (e.g. under the Competitiveness and Innovation Programme), and other programmes (e.g. the Technology Transfer programme run by ESA).

A specific measure is proposed to encourage GNSS-based innovation in the broadest possible range of applications, building on an existing initiative for inventors and with the support of European regions:

Action 23: The European Commission will support, together with the European GNSS Supervisory Authority (GSA), the establishment of an international prize mechanism involving, for instance, regional organizations that promote applications based on EGNOS and GALILEO in a broad range of areas, including social services to ageing or disabled persons and persons with reduced mobility.

¹³ GEOSS: Global Earth Observation System of Systems

Research on applications proved to be useful for example in speeding up the use of Internet. In the absence of military funding, European Union support for research into civilian GNSS applications represents an important incentive for European universities, research centres, SMEs and large-scale industry.

Action 24: The European Commission will allocate €8 mio worth of FP7 funding to a broad spectrum of research proposals on GNSS applications in 2011, and will seek additional funding through the mid-term review of FP7 to enable calls to be launched on an annual basis.

5. THE NEED TO UPGRADE EU FUNDING FOR R&D

Research is clearly the best source of innovation. Money spent on research has a direct effect on the uptake of new technologies.

However, GNSS cannot be considered a traditional market as the US, Russian and Chinese systems are under military control, and their specifications are subject to military rather than commercial considerations: these countries' home-grown industries can benefit directly from military-funded programmes to develop applications and services to a level of maturity at which they can be brought onto the civilian market.

For instance, federal US military-funded programmes to develop GNSS applications and services are estimated at €200 mio to €500 mio a year, compared with an average of €15 mio a year¹⁴ of European Union funding for civilian applications (cf. figure 2). As Europe focuses on the civilian uses of EGNOS and GALILEO, global EU funding for R&D (including national programmes) should target the US public level of investment on GNSS applications with a view to ensure that the GALILEO system is fully used and competitive.

In regard to the effort deployed by the EU budget, the current amount spent on GNSS R&D is very low compared to other high-technology sectors: for instance, in average, Information and Communication Technologies (ICT) sector gets each year 3 times more R&D funding than EU GNSS sector at equivalent EU turnover¹⁵.

Should the EU decide to restore the amount of €400 mio taken, in 2008, from the Seventh Framework Programme of the European Union for research, technological development and demonstration activities (2007-2013)¹⁶ (FP7) to finance the infrastructure, it would need to increase its funding for R&D on GNSS applications to approximately €100 mio a year, from 2010 on. This would represent less than 10 % of the budget for GNSS infrastructure.

With no unused allocations available under the current Multiannual Financial Framework (MFF) 2007-2013, the upgrade of EU R&D funding would require either an internal

¹⁴ FP7 funding to R&D for the end-user segment (applications, standardisation and certification, receivers, related international projects, mission evolution,) reached €27 mio in 2007, €40 mio in 2008 and €38 mio in 2011. That represents an average of €15 mio per year over the 2007-2013 period. In addition to that, 15M€ were dedicated to GNSS technology R&D in 2007 from FP7.

¹⁵ Over the duration of FP7, €3.3 billion have been earmarked for ICT (€1.2 billion in average per year), for an EU turnover worth €80 billion in 2009. To compare to a €15 million EU GNSS end-user segment R&D funding in average per year, contributing to a €25 billion turnover.

¹⁶ OJ L 412, 30.12.2006, p. 1.

redeployment within the FP7 budget or further Member States' national investment in this area.

| <i>(in € million)</i> | 2007-2009 | 2010 | 2011 | 2012 | 2013 | 2010-2013 | 2007-2013 |
|---|------------------|-------------|-------------|-------------|-------------|------------------|------------------|
| GNSS R&D FINANCIAL NEEDS | 80 | 100 | 100 | 100 | 100 | 400 | 480 |
| <i>Allocated in the FP7 for GNSS end-user segment R&D</i> | 65 | 0 | 38 | 0 | 0 | 38 | 103 |
| <i>Allocated in the FP7 for GNSS technology R&D</i> | 15 | 0 | 0 | 0 | 0 | 0 | 15 |
| Additional funding envisaged for the GNSS R&D | | 100 | 62 | 100 | 100 | 362 | 362 |
| ALLOCATION OF FP7 FUNDING FOR GNSS INFRASTRUCTURE (DEPLOYMENT) | 85 | 30 | 29 | 113 | 143 | 315 | 400 |

Figure 2: GNSS R&D financial needs

If the EU and Member States do not act, the market will be taken over by foreign industries that have benefited from military expenditure to establish their base, build critical strength and acquire dominant positions. The issue is not just economic: once Europe has established its independent GNSS infrastructure, it needs to maintain independence in terms of applications too: positioning and timing information are resources of extreme pervasiveness; more than 6% of the whole GDP of the European Union relies on it.

6. LOOKING AHEAD

This Action Plan will be updated regularly, as in a rolling programme: its objectives extend beyond 2020, but the current set of actions focuses on 2010-2013. A first review of the current proposal may come after the exploitation plan for the GALILEO post-2013 period has been adopted, as each action may be affected by the features of the forthcoming services, especially in terms of start-up timing, pricing policies, liability and intellectual property.

Adjustments may also be needed when decisions are taken on the further funding for research on applications, or on extending the EGNOS infrastructure to regions beyond Europe. Whilst the current plan emphasises EGNOS applications, further versions will progressively shift priorities towards GALILEO applications. A macro-econometric model and tool will also be developed to monitor the impact of the plan, with a view to feeding information back into this review process.

The proposed action will be taken by the European Commission and its related Agencies, and will involve national and regional authorities in the Members States, and other stakeholders as needed.