



Satellite Navigation Programme Update (EGNOS)

EGNOS Service Provision Workshop

28-29 September, 2015

Copenhagen



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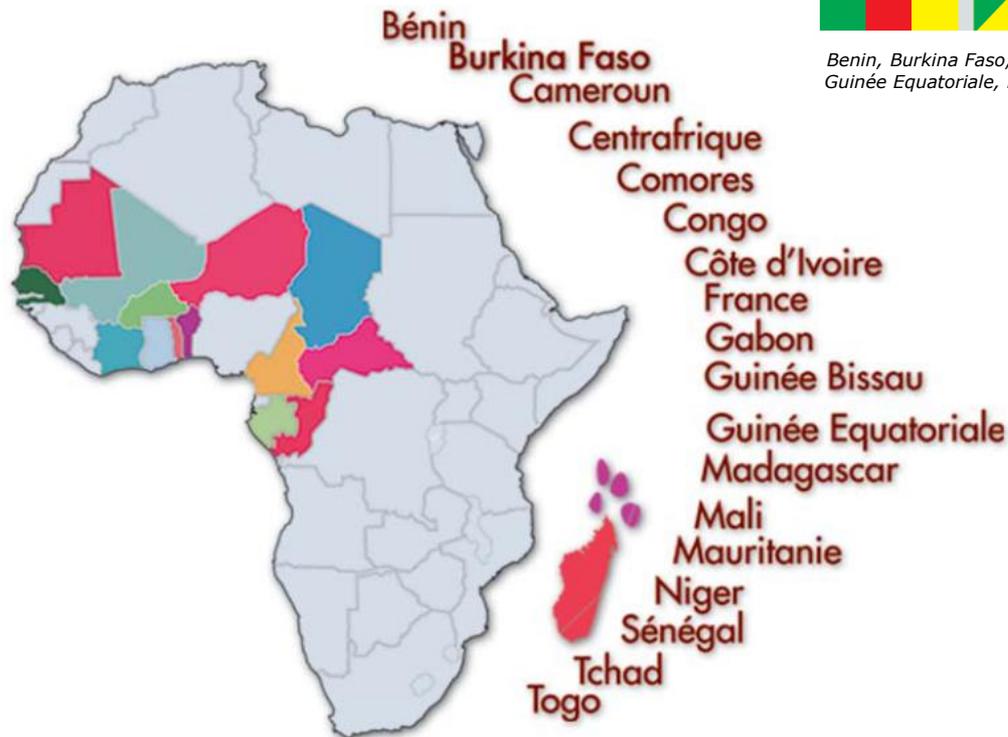
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ASECNA at a glance

- Member States

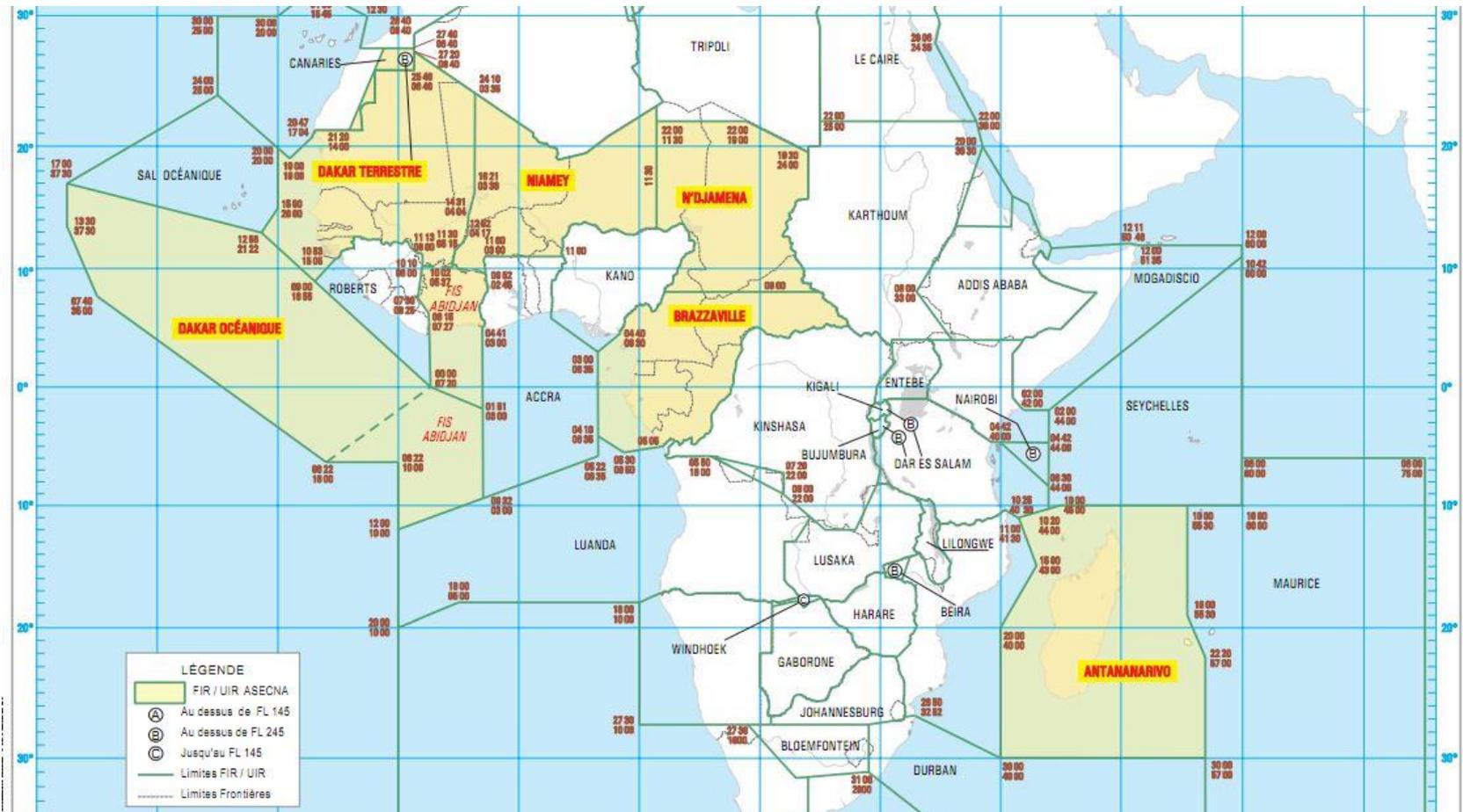


Benin, Burkina Faso, Cameroun, Centrafrique, Congo, Côte d'Ivoire, France, Gabon, Guinée Bissau, Guinée Equatoriale, Madagascar, Mali, Mauritanie, Niger, Sénégal, Tchad, Togo, Union des Comores



ASECNA at a glance

- Cooperative management of a Single Sky of 16,1 millions km² (1,5 * Europe)



Policy background



Africa-EU Strategic Partnership: a widespread multilateral political support to satellite navigation in Africa



- 3rd Partnership: Regional Economic Integration, Trade and Infrastructure - Second Action Plan (2011-2013) adopted by the Africa and EU Heads of State and Government at the 3rd Africa-EU Summit (November 2010) - Satellite Navigation as a priority



- Recommendations of the 5th Africa-EU Business Forum (March 2014)

- 'Roadmap 2014-2017' adopted by African and EU Heads of State at the 4th Africa-EU Summit (April 2014) - Commitment to provide sustainable and adequate financial and human resources, and establish governance and financing schemes, for the deployment EGNOS in Africa



Policy background



ASECNA policy framework

2005

- **Resolution n°2005 CM 44-11 taken by Member States :**
 - Requests the strengthening of the ASECNA-ESA technical cooperation for the implementation of EGNOS in Africa
 - Asks for the support of European institutions to benefit from the deployment of EGNOS/GALILEO to meet the ASECNA operational needs

2011

- **Mandate of the Director General:**
 - Programme « Renewal of the Agency »: strategic direction for the use of innovative and enabling technologies, including the extended use of satellite navigation services over the African Continent

Policy background



ASECNA policy framework

2011

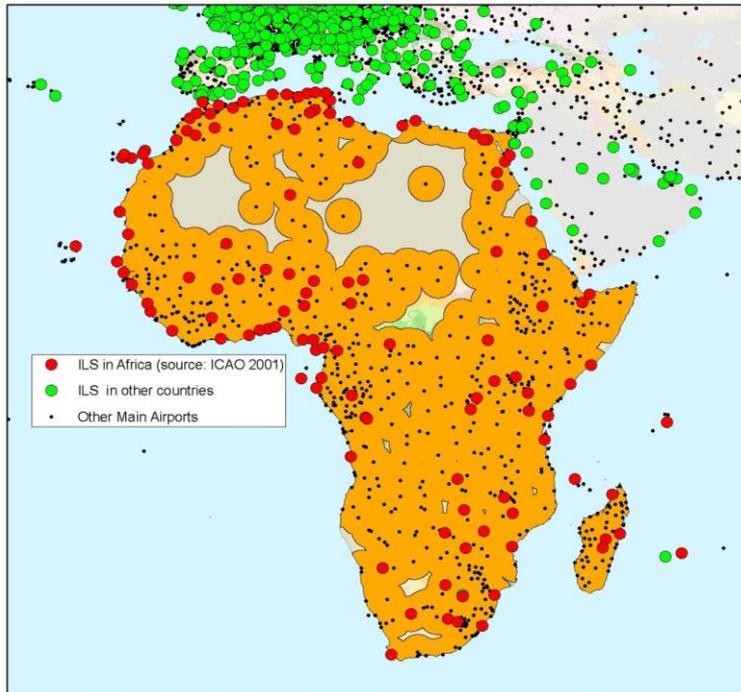
- **Resolution n° 2011 CA 120-18 taken by Member States**

- Supports the involvement of the Agency in the implementation of EGNOS/GALILEO satellite navigation services
- Requests the Director General to continue proceedings with the relevant European Organisations for the effective participation of the Agency in the initiatives aiming at deploying EGNOS/GALILEO over the AFI Region

2011

- **ASECNA satellite navigation programme (EGNOS/GALILEO)**

Operational needs



Safety lessons learned

37% of Africa is 250 km away from ILS equipped airport:

- main international airports
- only one runway end

87% of Africa is 250 km away from a main or regional airport

IATA forecasting 2013-17 CAGR : 5,3%

ASECNA strategic directions

LNAV/VNAV (Baro) (short-term)
LPV (SBAS) (medium-term)

Need for RNP APCH APV :

Strategic directions

- **Vision:**

- Prepare the future
- Anticipate and manage of a major technological leap, leading to a sound change in the nature of services and of their model of governance due to their global character
- Strengthen the positioning of the Agency as an added-value services provider, in an increasing competitive environment

- **Strategy:**

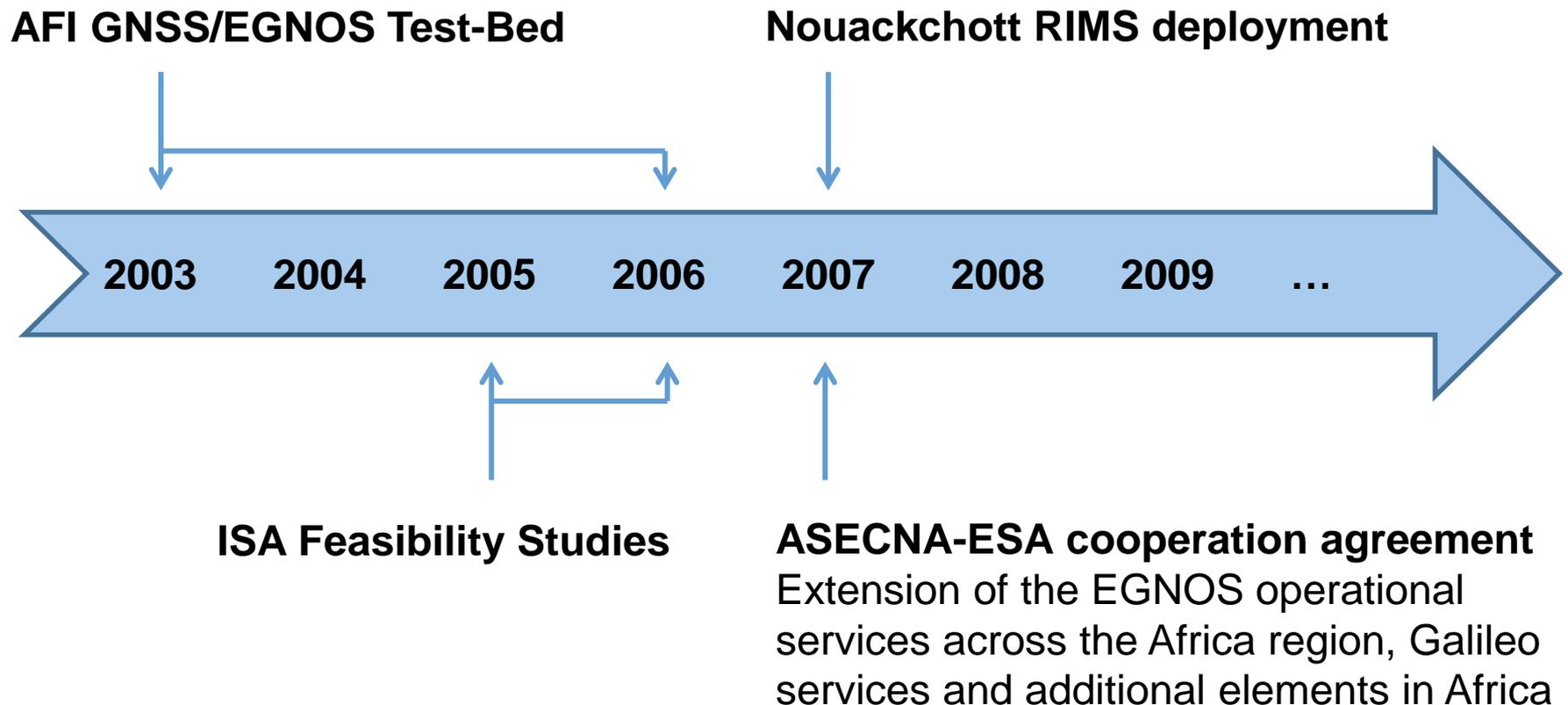
- A progressive step-by-step approach with programmatic decision points
- Seeking for quick wins and early benefits with pioneer services
- Incremental implementation:
 - Services levels - coverage and performances , infrastructure etc.
 - Expendability and upgradability towards future EGNOS technology evolutions
 - Gradual transformation of jobs and competencies

Objectives

- **Pursuing:**
 - Ownership of the infrastructure
 - Control and provision of Signal in Space (SiS)
 - Provision of services to end users
- **Objectives:**
 - **Step 1:** Provision of **Early** EGNOS-based **services** (LPV/LP, L1) by **2019/20**
 - **Step 2:** Provision of **Full** EGNOS-based **services** (LPV/LP, L1/L5) by **2023 onwards**

Towards early services

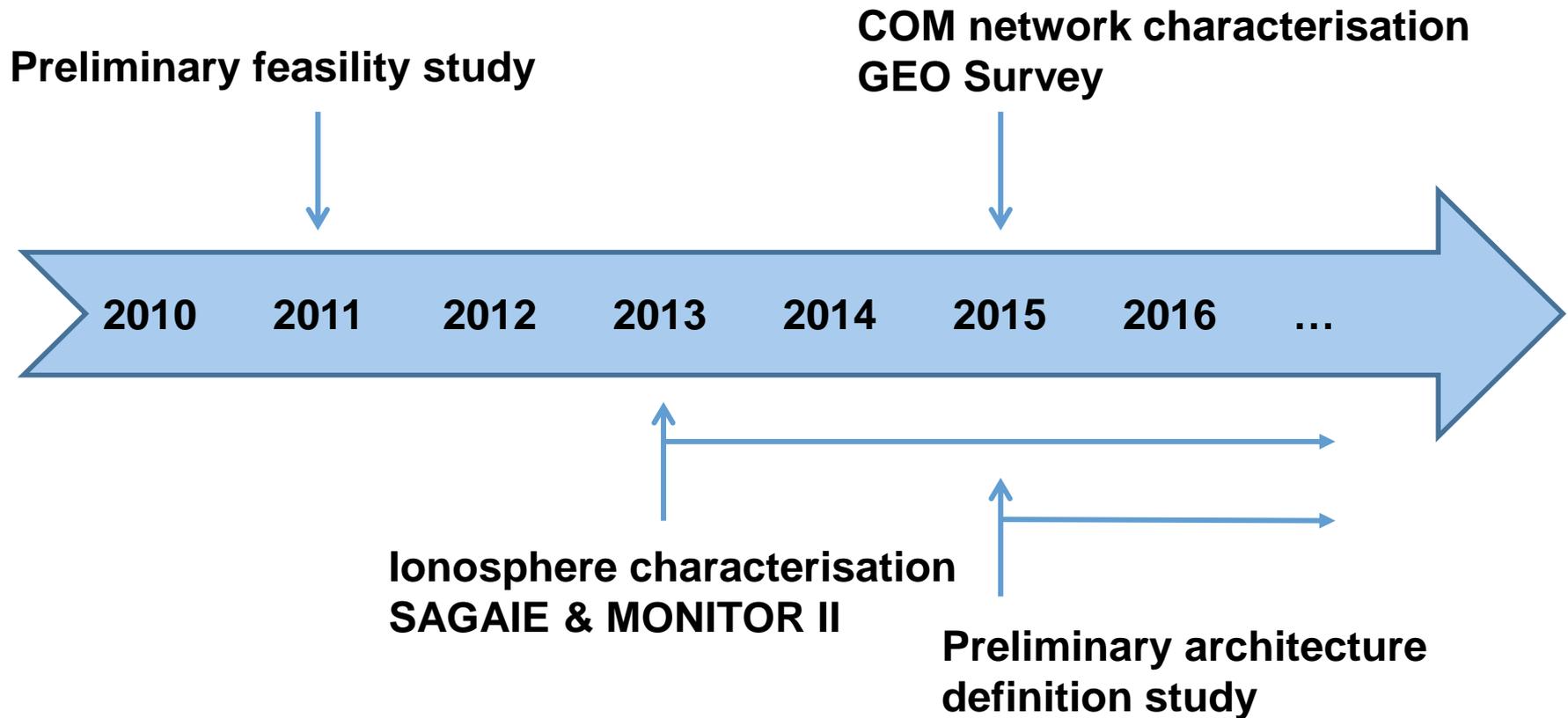
- **Past activities in cooperation with ESA:**





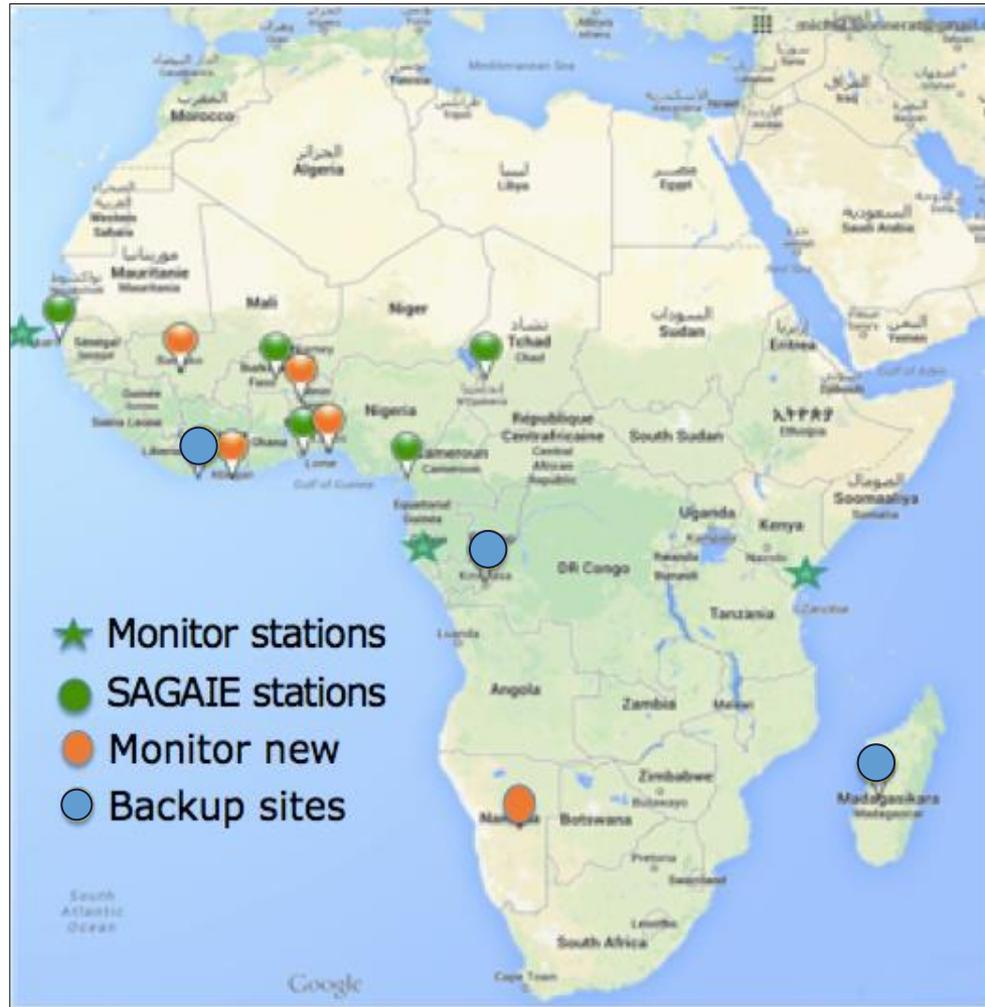
Towards early services

- **ASECNA Programme**



+ R&D projects: SIRAJ, ACCEPTA, MAGNIFIC ...

Towards early services



SAGAIE & MONITOR II Stations

Towards early services

- **Preliminary Architecture Definition Study**

- **Objectives:**

- Define the incremental path for Step 1 with the best architecture options, taking into consideration:
 - coverage * performances, benefits / costs (CAPEX/OPEX)
 - expendability and upgradability towards future EGNOS evolutions, schedule of development of EGNOS assets etc.
 - complementarity with GBAS
- Prepare and provide a clear view on the implementation phase (C/D) including a detailed development & implementation plan



- Technical officer:

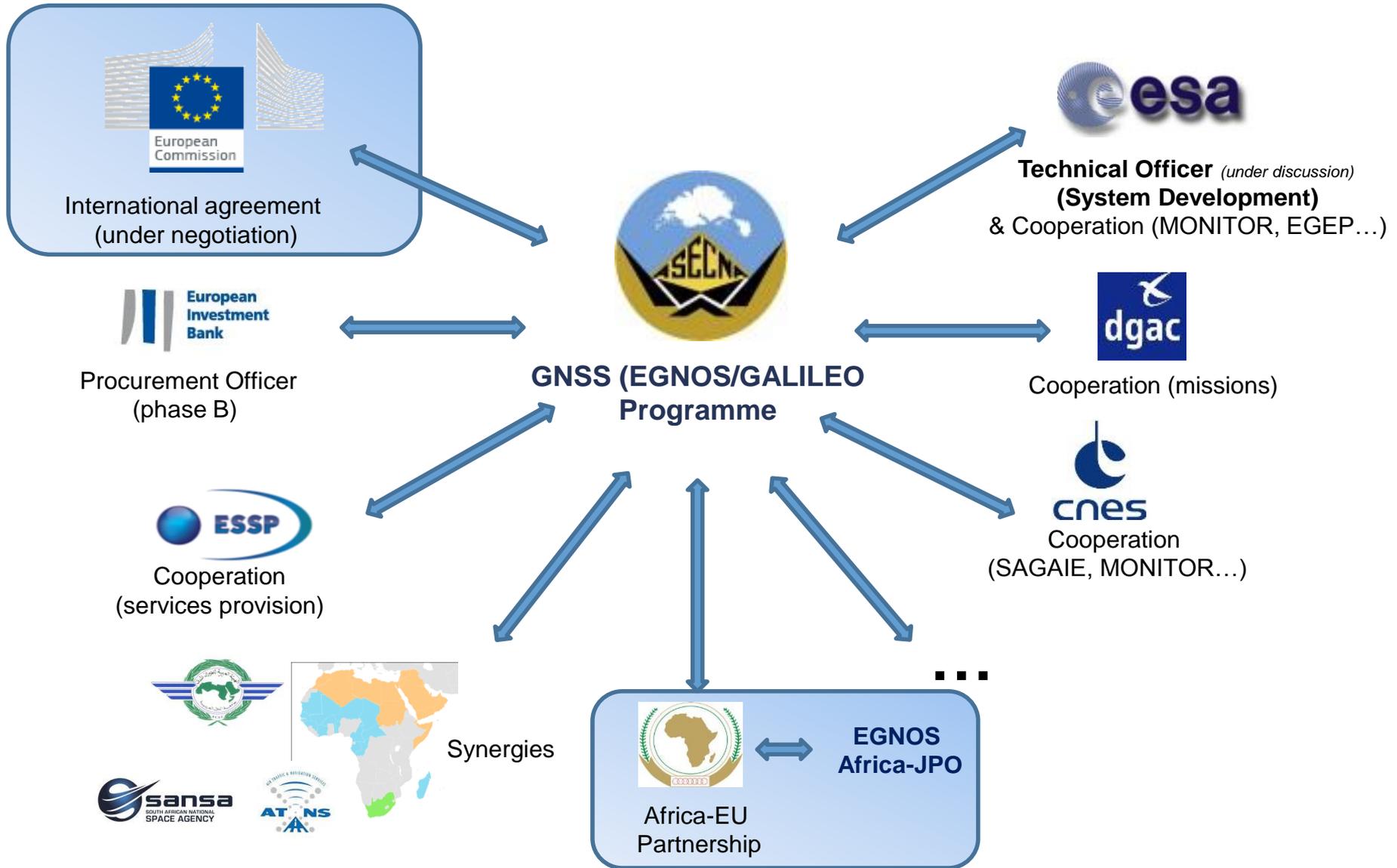


(*under discussion*)

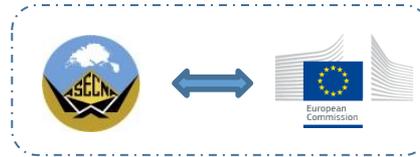
- Procurement officer



Cooperation and external relations



ASECNA-EU international agreement



- To lay down the terms and conditions for the provision of SBAS services in ASECNA based on the European Satellite Navigation Programme EGNOS
- As per Regulation (EU) 1285/2013 of the European Parliament and of the Council on the implementation & exploitation of European Satellite Navigation Systems
- In accordance with Article 218 of the Treaty on the Functioning of the European Union (TFEU)
- Opening of negotiations authorised by the Council of EU (25-26/09/14)
- Negotiations, launched on 3 March 2015 in Dakar, progressing satisfactorily

EGNOS-Africa Joint Programme Office

JPO role as a Pan-African GNSS/EGNOS coordinating entity

- Part of the institutional framework to ensure harmonized, safe and efficient SBAS/EGNOS services in Africa
- A core Capacity building Team for Africa





EGNOS-Africa Joint Programme Office

EGNOS implementation in Africa - 'Modules' creation

- Can now support all types of applications for future programmes related to GNSS/EGNOS in Africa
- Developed 'GNSS/EGNOS services implementation roadmap', a comprehensive strategy document based on a 'Module' concept which provides to the Stakeholders, the necessary guidelines to address EGNOS deployment in Africa
- The modular concept as recommended in the Roadmap will drive EGNOS implementation in Africa
- It is elaborated based on the regional cooperation framework through the RECs and with due consideration of on-going initiatives (ASECNA, MEDA, RSA)

EGNOS-Africa Joint Programme Office

EGNOS implementation in Africa - 'Modules' creation

- Four modules have been recommended for Africa:
 - Northern (**M1**),
 - West-Central (**M2**),
 - Eastern Africa (**M3**),
 - Southern (**M4**)
- Status: initial consultations RECs on-going for the modules





EGNOS-Africa Joint Programme Office

Proposed EGNOS services for Africa

EGNOS v2 L1 services	Date
Open Service GPS	2020
Safety of Life NPA GPS	2021
Safety of Life NPA+APV1+LPV200 GPS	2023

EGNOS v3 DFMC services	Date
Open Service GPS, GPS+GALILEO	2025
Safety of Life NPA GPS, GPS+GALILEO	2026
Safety of Life NPA+APV1+LPV200 GPS, GPS+GALILEO	By 2028
Safety of Life Maritime	TBD
EDAS services	TBD

EGNOS-Africa Joint Programme Office

Potential applications in non-Aviation

- Surveying, Mapping and GIS
 - To benefit the 90% unsurveyed rural land in Africa
 - To enable acquisition of fundamental and specific geospatial datasets
- Agriculture
 - Agriculture is a priority in Africa Economy agenda
 - Optimizing mechanised system will further support the mechanisation trend
- Maritime/Road/Rail
 - To complement vessel maritime applications and cost effective and safe vessel navigation solutions for inland waterways
 - To enable road regulation and usage control, vehicle e-tolling solutions
 - To provide cost effective alternatives for train control and signaling, rail track surveying
 - To support the development of a multimodal transport system, as per NEPAD 'fully connected African Continent' concept





THANK YOU FOR YOUR ATTENTION

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