



EGNOS: a satellite navigation system for Europe, and an opportunity for Africa!

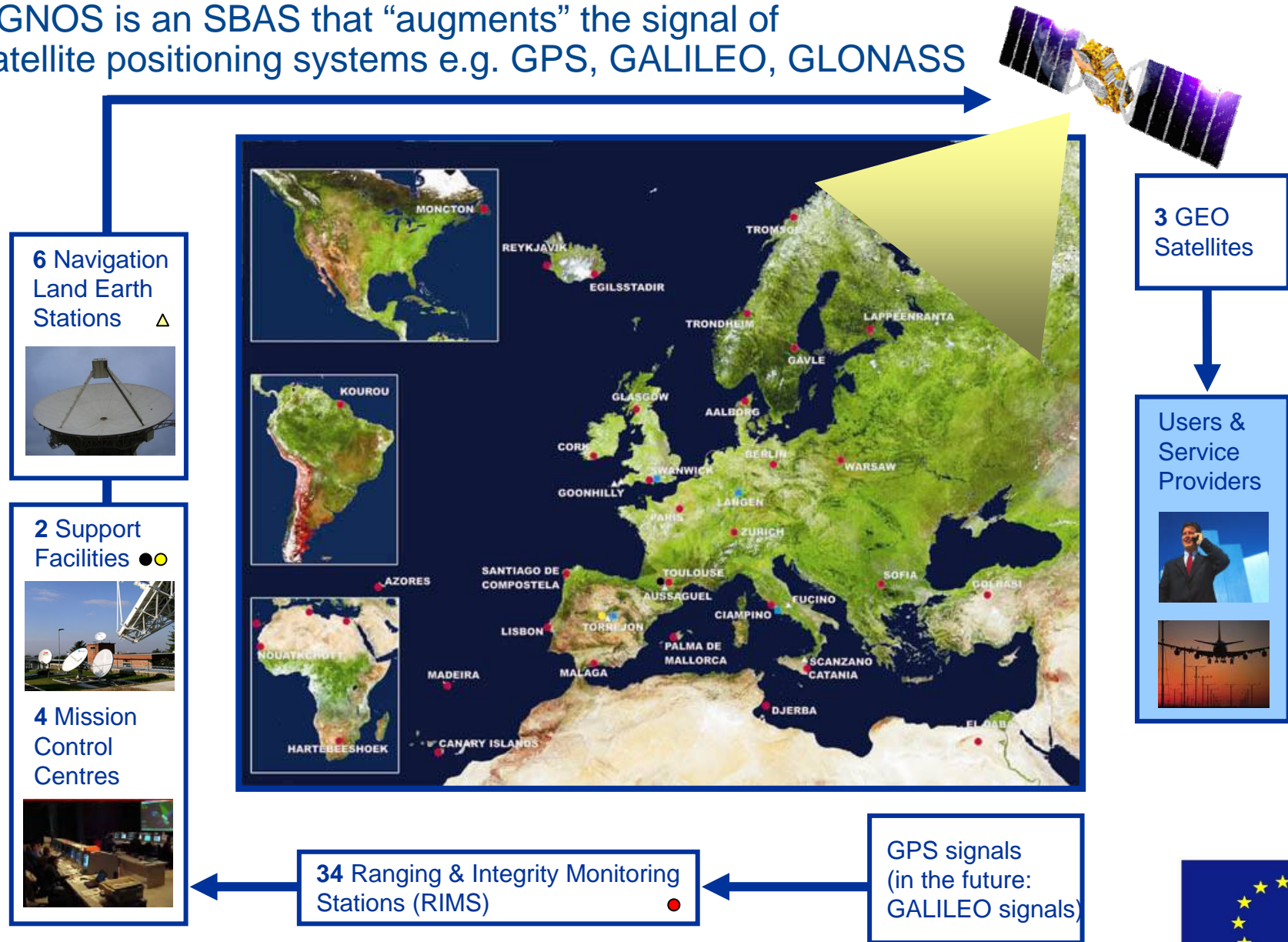
Pieter De Smet

Galileo and EGNOS Applications and International Cooperation
European Commission



EGNOS System Architecture




EGNOS is an SBAS that “augments” the signal of satellite positioning systems e.g. GPS, GALILEO, GLONASS



EGNOS Services



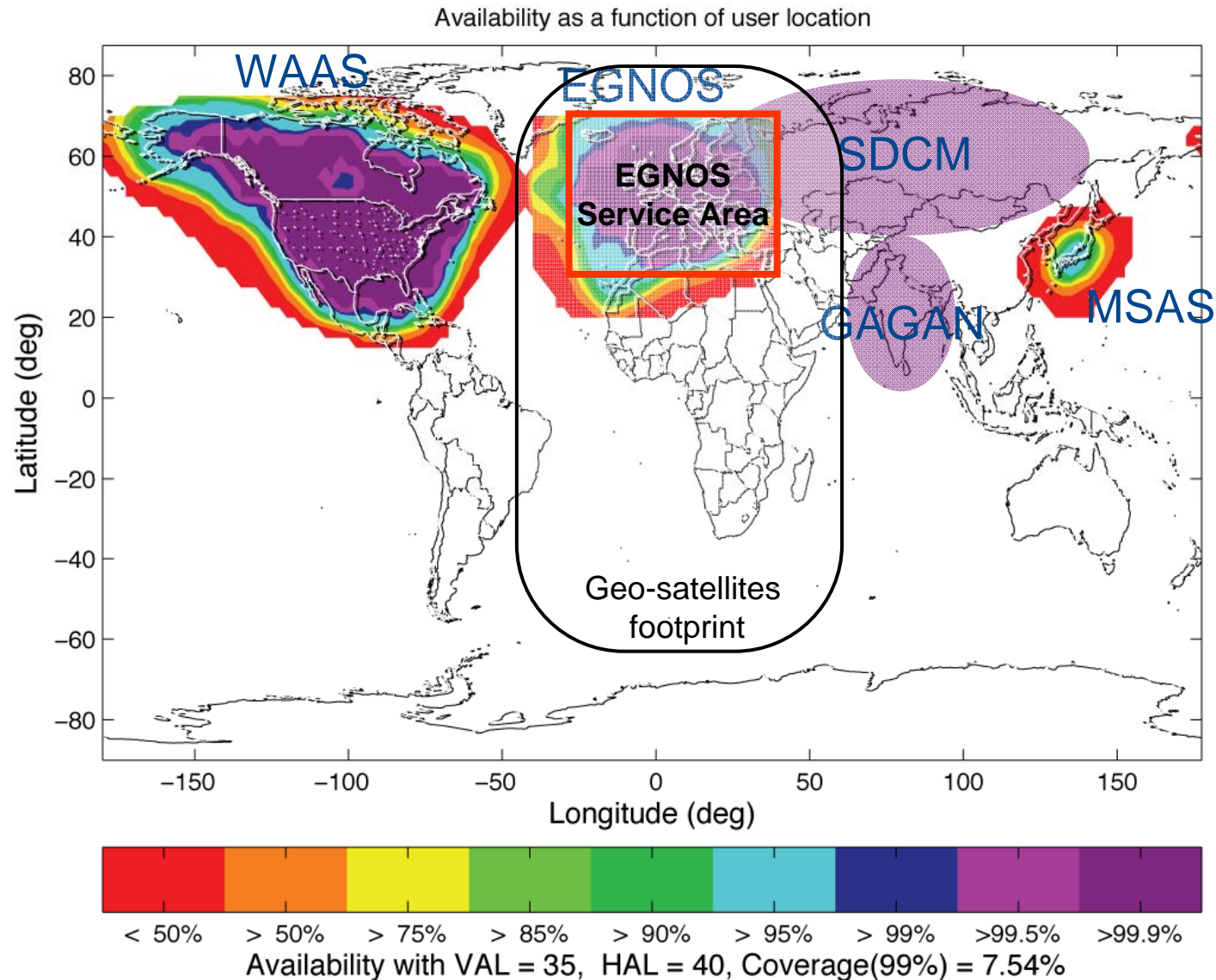
EGNOS will deliver its services on a very long-term basis

Service	Characteristics	Service Status	
Open Service	accuracy ~1m, free of charge	available since October 2009	
Safety of Life Service	accuracy ~1m, free of charge compliant to aviation standards (integrity)	available since March 2011	
Commercial Service (EDAS)	accuracy <1m, corrections provided by terrestrial networks	betatest service since 2008 service to be made available in 2012	

EDAS: EGNOS Data Access Server



Towards a worldwide SBAS coverage



- Discussions in the frame of bi-lateral and multi-lateral fora on-going.

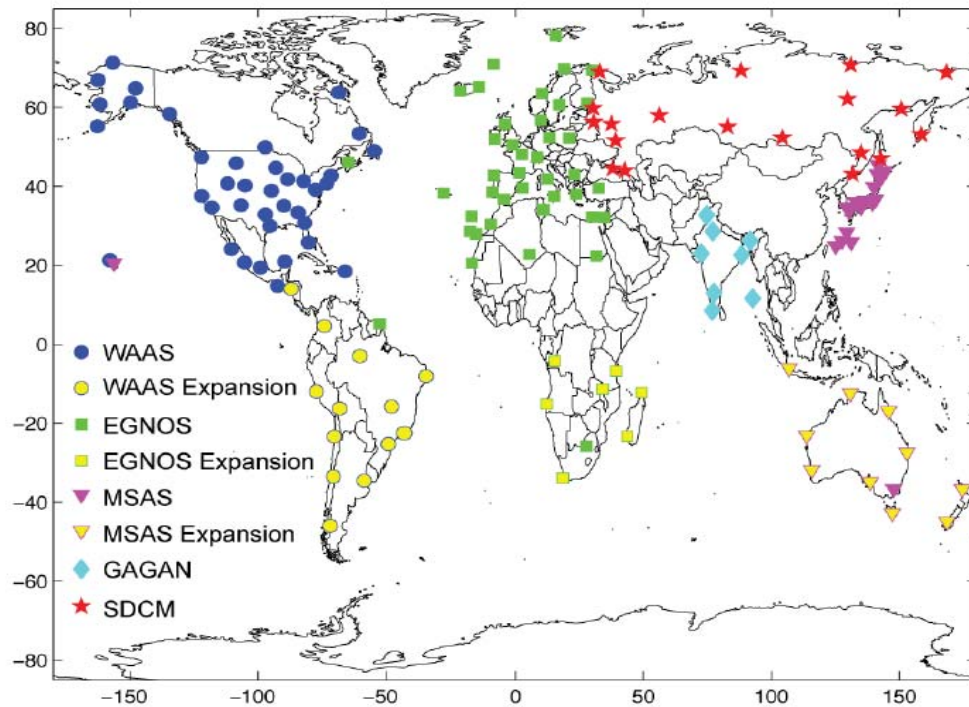
- ICAO endorsement required.

Source: Stanford University



Potential further coverage

Expanded Networks



- Service coverage could be extended through deployment of sole **ground** infrastructure, sharing **space** segments of the existing systems
- **Less stations** will be needed as SBAS technology evolves (dual frequency)

(*) source: FAA (US). Location of ground stations is only indicative

Benefits of SBAS in Africa

- The economic **opening-up of airports and isolated regions**, by making regional airports currently not equipped with the traditional aid instruments (ILS, VOR, DME) accessible to national, intercontinental, and intra-continental flights
- Facilitated **exchanges with Europe**, through the harmonisation of operational flight procedures between African countries and the rest of the world
- Savings on **investments at local level**, by reducing drastically the need and maintenance costs of ILS-type ground facilities in the airports
- **Safer, cheaper, eco-friendly** guidance during airport approaches
- Positive and very substantial repercussions in other sectors, such as the **railways, inland waterways, agriculture** and the **territory planning**
- Reduction of costs and greater reactivity for **humanitarian interventions**

EU and African Union Initiative has been launched to extend the coverage of EGNOS to the African continent



A stepwise implementation

Technical Implementation can follow an **incremental, modular** approach

- Coverage of Mediterranean area and the North Africa (ongoing) *CURRENT*
 - Ground stations of EGNOS in Tunisia, Egypt, Algeria, Mauritania, and Morocco

- APV-I services in Southern Africa *SHORT TERM*
 - Work in progress
- NPA coverage of the entire African continent*

- APV-I coverage of Africa *LONGER TERM*

() Upon planned MSG (Message) 27 modification, EGNOS NPA coverage will already extend over Africa to 20 degrees South*



From signal delivery to full service provision

- Stepwise and modular approach to deployment with some countries (eg RSA) or regional organisations (eg ASECNA) as precursors
- Financing capital and operational expenditure
- Certification process
- Liability principle
- Participation in governance
- Local service provision
- Regional issues

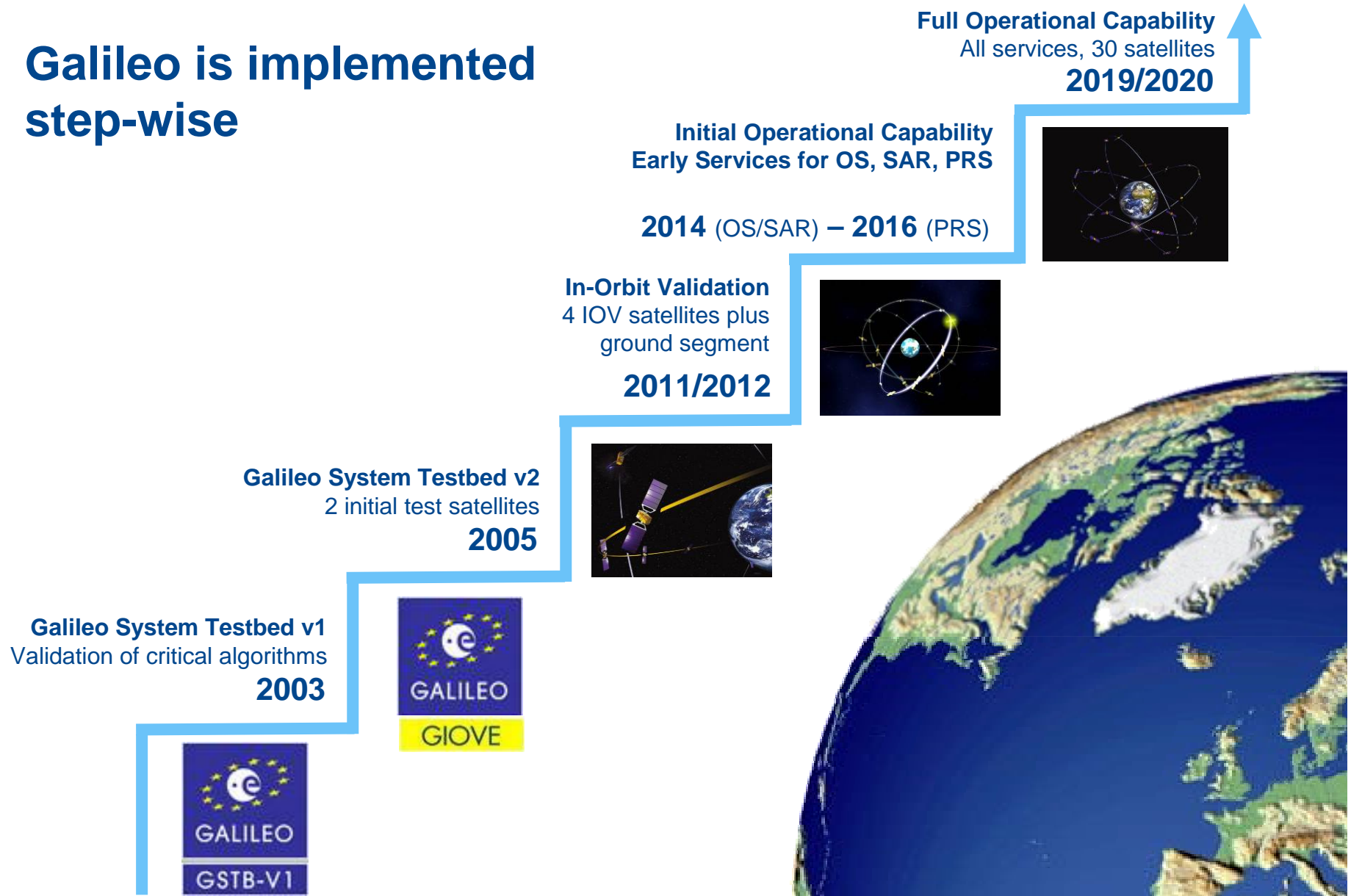


Galileo Update

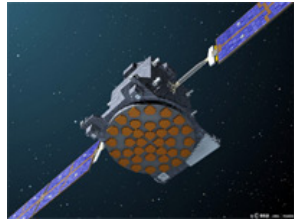


Galileo Implementation Plan

Galileo is implemented step-wise



Galileo Spacecrafts



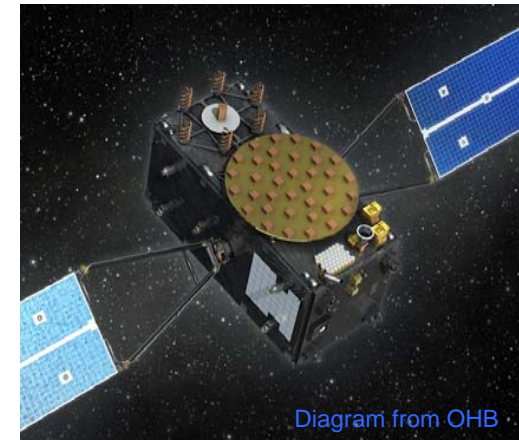
Giove A
600 Kg / 700 W
2yr Life
2006



Giove B
530 Kg / 1.1 kW
2yr Life
2008



IOV (4 off)
730 Kg / 1.7 kW
12yr life
Launcher 2011
Soyuz



FOC (14 off)
730 Kg / 1.9 kW
12yr life
Launcher options
Soyuz, Ariane



Constellation Deployment in Progress



21/10/2011, Kouru, SOYUZ dual satellite launch

- 2 more spacecrafts will be launched in 2012
- 14 additional satellites are under construction
- 6 additional satellites under procurement



Thank you for your attention

Pieter De Smet
European Commission
<http://www.satellite-navigation.eu/>

