

# Satellite navigation in Africa

A satellite infrastructure for regional integration and economic growth

Addis Ababa, 2 October 2013



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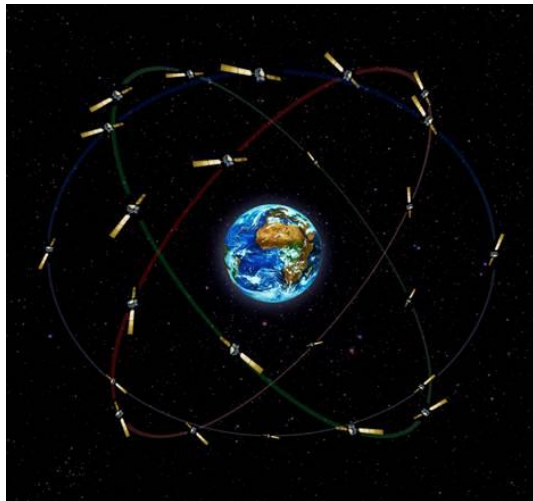
**European Commission**

*Directorate-General for  
Enterprise and Industry*

# Satellite navigation in Europe



- ★ Autonomous infrastructure
- ★ Performances similar to GPS
- ★ Global coverage

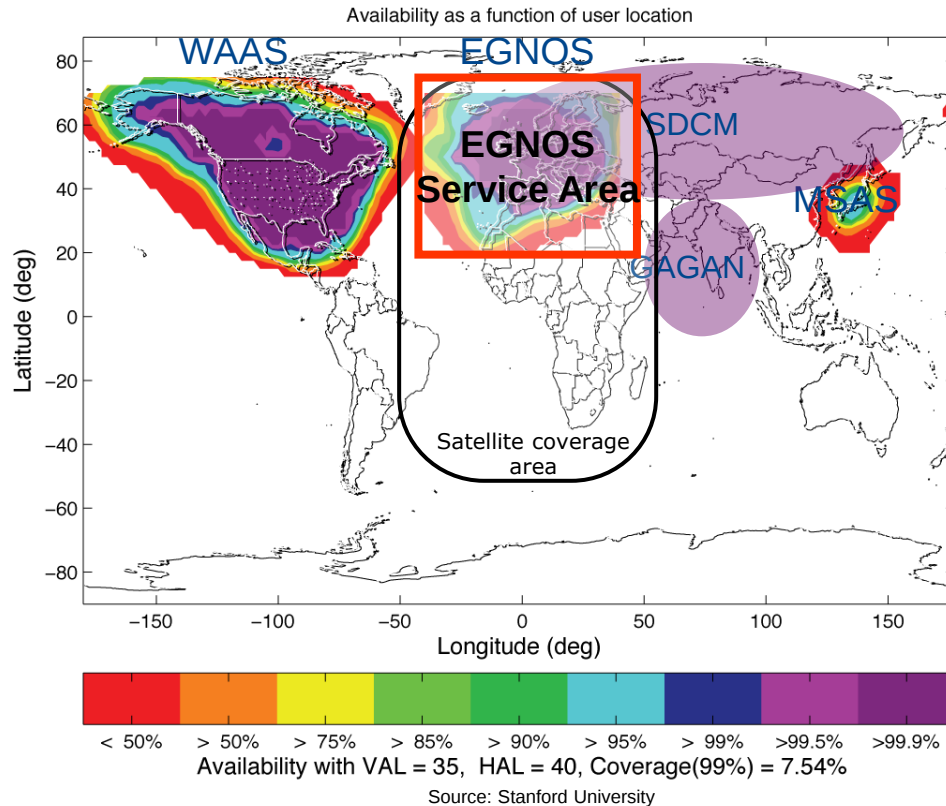


'It's there, use it'

- **European**
- **Geostationary**
- **Navigation**
- **Overlay**
- **System**

- ★ Improves GPS over Europe
- ★ Major stepping-stone towards Galileo
- ★ Operational since October 2009
- ★ **EGNOS is Europe's first step towards independent satellite navigation**

# The potential coverage of Africa



- Already available and operational today **in Europe**
- Possible extension with deployment of ground infrastructure (stations) **in Africa**

## Aviation

Instrumental vertical guidance,  
reduces accident probability  
(Safer landing, fewer accidents)



Route optimisation (Fuels savings,  
CO2 emissions reduction)

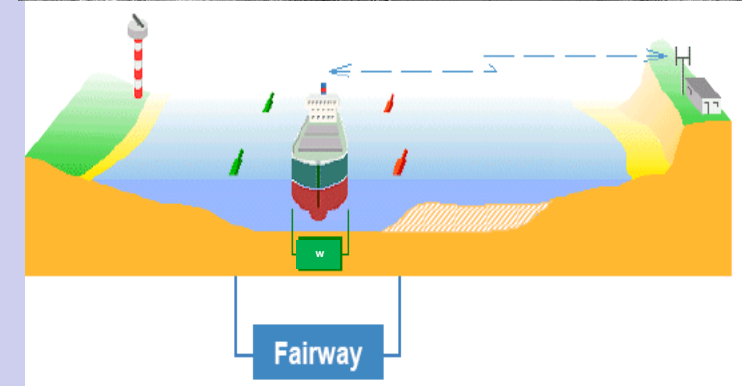
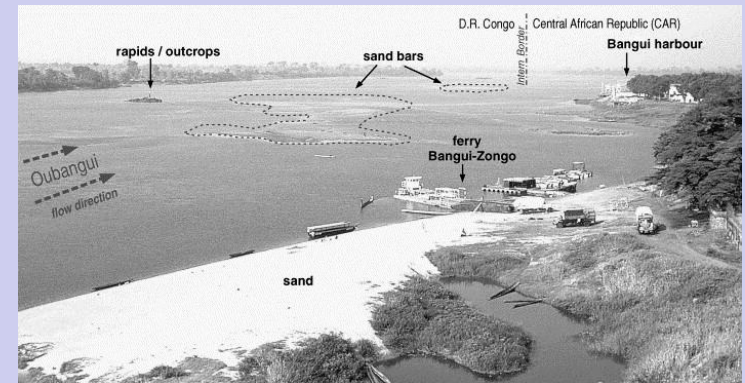


Phasing out of current ground-  
based equipment for aid to nav  
(Costs reduction for airports)



All-weather landing (Less delays,  
diversions and cancellations)

## Rivers and inland waterways



**EGNOS** can support **navigation** and **dredging** vessels operations through the 'shallow' areas, allowing **all season navigation**

## Rail



Satellite-based replaces balises

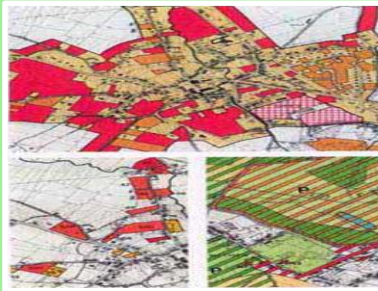
**Costs savings** on track control,  
signalling equipment, maintenance,  
investments

**Socio-economic benefits:** potential  
**expansion** of the rail network,  
**safety, capacity** and **reliability**

## Land management

**Cadastre** (High accuracy, free of charge, for rural parcels measurements)

**Cartography** (High accuracy, low-cost service, for hydrographical survey and geographic data collection)



## Precision Agriculture



Efficient **irrigation** and **water management**  
**Precise spraying** for better use of pesticides and fertilizers

Reduces **environmental** impact, increases agriculture **productivity** and cost **savings** to the farmers, contributes to food **security**

## Tracking and tracing



**Multimodal and container transport** (low cost services for freight applications, Container tracking in Inland Container Depot)

## Energy and mining industry

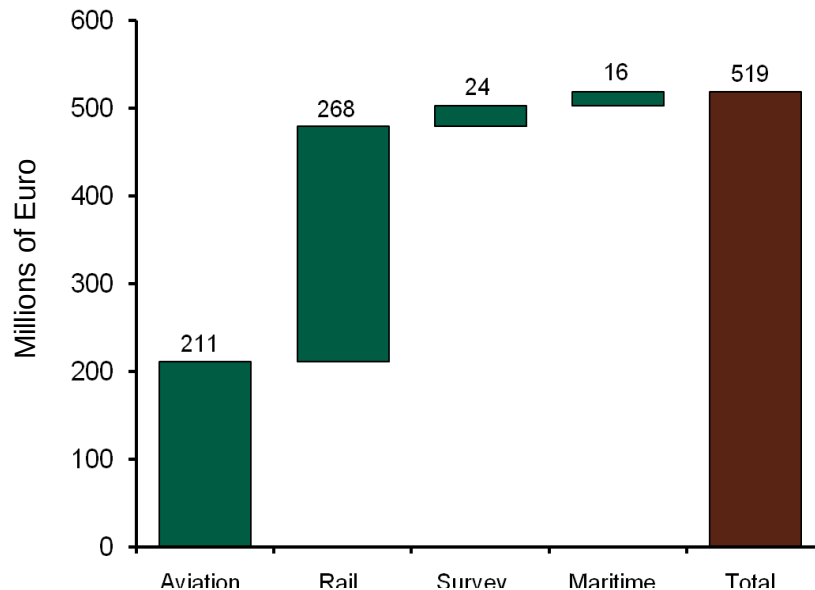


Routine surveying, maintenance

# A largely positive Net Present Value

EGNOS in Africa cumulative undiscounted net benefits on a 30 years timeframe will amount to c. €1.7b versus investments of c. €360m for the aviation sector

**Total** Net Present Value (NPV) surpass 500€m on a 30 years timeframe



Total Net Present  
Value (NPV)\*  
~520 €m

\* With a 8% discount rate

# Widespread political support to satellite navigation in Africa

- **Partnership between the European Union and Africa. Connecting Africa and Europe: working towards strengthening transport cooperation** COM(2009)301, June 2009
- **Action Plan on Global Navigation Satellite Systems (GNSS) Applications** COM(2010)308, June 2010
- **Space for the African citizens**, High-level Meeting under the Belgian EU Presidency, September 2010
- **7<sup>th</sup> Space Council**, Resolution on "Global challenges: taking full benefit of European space systems", Brussels, November 2010
- Declaration of the **4<sup>th</sup> EU-Africa Business Forum**, Tripoli, 27-28 November 2010
- **3<sup>rd</sup> Partnership: Regional Economic Integration, Trade and Infrastructure - Second Action Plan adopted at the Africa-EU Summit (November 2010) - Priority No 2: Support to Air Transport Sector and Satellite Navigation**
- **ICAO** 12th Navigation Conference (Montreal, November 2012), AU Member States resolved to embrace GNSS
- Resolution of the **ASECNA\*** Admin Council (July 2011): encourage EGNOS implementation and mandate the DG to cooperate with EU
- **ACAC** (Arab Civil Aviation Commission) formally expressed (May 2013) the intention to discuss institutional, financing and technical aspects.



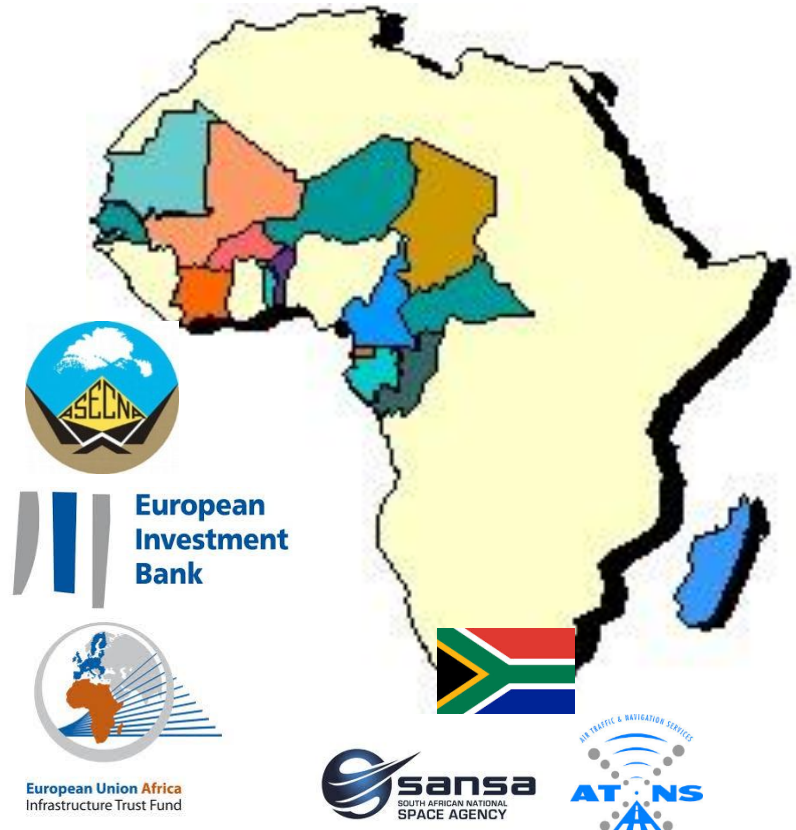
(\*) Agence pour la Sécurité de la Navigation aérienne en Afrique et à Madagascar (Benin, Congo, Madagascar, Chad, Burkina Faso, Ivory Coast, Mali, Togo, Cameroun, Gabon, Mauritania, Central Africa, Guinea Bissau, Niger, Comoros Islands, Equatorial Guinea, Senegal)

# Preliminary activities already funded: Technical studies

## 1 *Funds: ITF and own resources*

**I. ASECNA** is launching a preliminary architecture definition study with use of own resources and a grant from the **Infrastructure Trust Fund**, through the **European Investment Bank**. c.€6M

**II. The Republic of South Africa** should launch soon a preliminary architecture definition study, involving the **South African National Space Agency**, on own funds.



# Preliminary activities already funded: Infrastructure deployment

## 2

**Funds: ENPI** (*European Neighbouring Policy Instrument*)

### **Euro-Mediterranean Partnership (EUROMED)**

Euromed GNSS I (2006-09): €4.5M

Euromed GNSS II (2012-14): €4.5M



EUROMED



I. Installations of EGNOS ground stations (RIMS) to improve the coverage of **southern EU countries**, the **Mediterranean basin** and **Northern African coast**

II. Implementing actions aimed at preparing the Northern African countries towards the utilisation of EGNOS in **civil aviation** and other **transport** and **non-transport** domains



# Preliminary activities already funded: Capacity Building

**3** ***Funds: Intra-ACP 10th EDF*** (€9M)



PROGRAMME STEERING  
COMMITTEE  
(AUC, RECs, ACP Sec, EC)



Aviation Safety



Aviation Security



*Deployment of a **regional sub-Saharan** Joint Programme Office (5 recruitments on-going + 5 recruitments planned in 2014)*

*Set-up and support for working sessions of stakeholders to address Governance, Liability & Certification, Services Roadmap, etc.*

***Training** of the Office staff by UNESCO/ICTP (training on managerial and technical aspects)*

# EGNOS in Africa: a turning point

- In 2014, the on-going activities will have provided:
  - An operational and trained Joint Programme Office
  - Technical elements from technical studies on system architecture for specific regions
  - An initial infrastructure partially covering Northern Africa
- *The EU MS and the Commission shall take a **major programmatic decision (Go/No-go)** on the extension of EGNOS over the African continent in 2014*
- The programming exercise for financing instruments (EDF, DCI) is on-going

**Governance and funding** schemes shall now be consolidated

Players involved: AUC, ACP secretariat, RECs, Member States, Space agencies, ANSPs, Inter-governmental and continental organisations, Financing institutions

# Funds needed for a full pan-African service provision

|                                            |                                                                                                              | Budget need<br>2014-20 (€ m) |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------|------------------------------|
| Management<br>and technical<br>assistance  | Continuation of the <b>African GNSS office</b> and capacity building, with a ramp-up until 20 people in 2020 | c. 60                        |
|                                            | <b>Technical assistance</b> (incl. ESA/GSA) for Design and Deployment phases                                 |                              |
| Infrastructure<br>design and<br>deployment | Design and Deployment of Early Services in <b>Northern Africa</b>                                            | c. 20                        |
|                                            | Design and Deployment of Early Services in <b>Western and Central Africa</b>                                 | c. 30                        |
|                                            | Design and Deployment of Early Services in <b>Southern Africa</b>                                            | c. 20                        |
|                                            | Design and Deployment of full <b>pan-African services</b>                                                    | c. 120                       |
| Users adoption                             | Support to <b>Users adoption</b>                                                                             |                              |

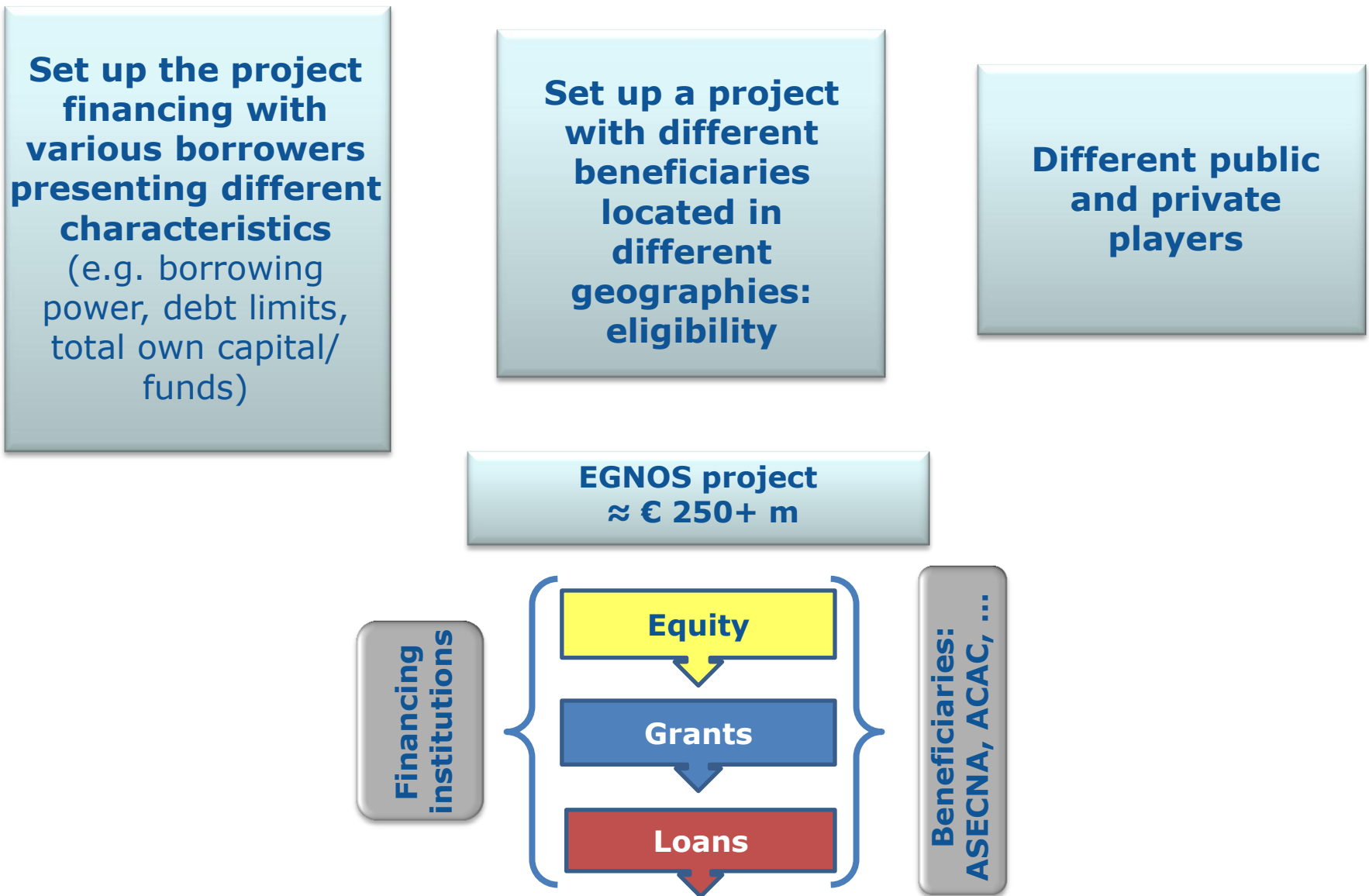
**250+**

# Need for public investments

- ❑ *Satellite navigation as a **public good** ('the fifth utility') for economic growth and regional integration*
- ❑ *Huge **socio-economic benefits** (e.g. in aviation safety, land management, agriculture) but low monetary returns*
- ❑ ***No feasible cost-recovery** scheme from the users*
- ❑ *The **failure of the PPP** (Public-Private Partnership) scheme for Galileo in Europe*



# Setting-up the appropriate financing scheme



**Main issues - EGNOS is a trans-boundary infrastructure**

# Event on financing Satellite Navigation Infrastructure in Africa

1<sup>st</sup> October 2013, Addis Ababa, Ethiopia

Hilton Hotel



- EIB – European Investment Bank
- KfW – Kreditanstalt für Wiederaufbau
- AFD – Agence Française de Développement
- BDEAC – Banque de Développement des Etats de l'Afrique Centrale
- BOAD - Banque Ouest Africaine de Développement
- DBSA – Development Bank of Southern Africa



- CEMAC – Communauté Economique et Monétaire de l'Afrique Centrale
- AFCAC – African Civil Aviation Commission
- ATNS (South Africa) – Air Traffic and Navigation Services
- SANSA – South African National Space Agency
- ASECNA - Agence pour la Sécurité de la Navigation aérienne en Afrique et à Madagascar
- EC – European Commission
- ECAA – Ethiopian Civil Aviation Authority

# Towards an appropriate governance and financing scheme

- **Conclusions** of the Side Event on Financing Satellite Navigation in Africa: ***declaration of intent***
  1. Support for the initiative
  2. Understanding of the financial needs
  3. Necessity of structuring the financing scheme
  4. Acknowledge the intended contribution of the European Commission
  5. Commitment of the institutional stakeholders
- **Roadmap**
  - Stakeholders consultations coordinated by JPO – Workshop December 2013
  - Second meeting with Financing Institutions in Q1 2014

Both institutional stakeholders and financing institutions are invited to manifest interest

# Thank you for your attention!

